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14. ABSTRACT
The Department of Defense (DoD) had funded an equipment grant award to build the capacity in the Department of Industrial Technology at California State University, Fresno (Fresno State). The grant award was used to acquire equipment and instrumentation systems for education and research at Fresno State. This Final Report includes (a) List of all items of equipment actually acquired by name, manufacturer where possible, and cost; (b) Description of any special circumstances regarding the acquisition of the equipment, and (c) A concise summary of the research projects on which equipment has been or will be used including support of (i) the research work described in the

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Report Title

Final Report: Capacity Building for Research and Education in GIS/GPS Technology and Systems

ABSTRACT

The Department of Defense (DoD) had funded an equipment grant award to build the capacity in the Department of Industrial Technology at California State University, Fresno (Fresno State). The grant award was used to acquire equipment and instrumentation systems for education and research at Fresno State. This Final Report includes (a) List of all items of equipment actually acquired by name, manufacturer where possible, and cost; (b) Description of any special circumstances regarding the acquisition of the equipment, and (c) A concise summary of the research projects on which equipment has been or will be used including support of (i) the research work described in the proposal and (ii) other research work of interest to DoD as per EXHIBIT B of the DoD award/contract. The proposal mentioned four primary objectives to be achieved. The objectives (I) and (II) have already been achieved. The objectives (III) and (IV) are considered as the long-term: meaning, the outcome of the objectives (I) and (II) will be used to accomplished (III) and (IV). The performance period of this grant award was February 1, 2014 to January 31, 2015. The project has been completed successfully. Detail Transaction Analysis Report is attached.

Enter List of papers submitted or published that acknowledge ARO support from the start of the project to the date of this printing. List the papers, including journal references, in the following categories:

(a) Papers published in peer-reviewed journals (N/A for none)

Received Paper

TOTAL:

Number of Papers published in peer-reviewed journals:

(b) Papers published in non-peer-reviewed journals (N/A for none)

Received Paper

TOTAL:

Number of Papers published in non peer-reviewed journals:

(c) Presentations

Number of Presentations: 0.00

Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):

(d) Manuscripts

Received Paper

TOTAL:

Number of Manuscripts:

Books

Received Book

TOTAL:

Received Book Chapter

TOTAL:

Patents Submitted

Patents Awarded

Awards

Graduate Students

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Names of Post Doctorates

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Names of Faculty Supported

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Names of Under Graduate students supported

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Student Metrics

This section only applies to graduating undergraduates supported by this agreement in this reporting period

The number of undergraduates funded by this agreement who graduated during this period: 0.00
The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:..... 0.00
The number of undergraduates funded by your agreement who graduated during this period and will continue to pursue a graduate or Ph.D. degree in science, mathematics, engineering, or technology fields:..... 0.00
Number of graduating undergraduates who achieved a 3.5 GPA to 4.0 (4.0 max scale):..... 0.00
Number of graduating undergraduates funded by a DoD funded Center of Excellence grant for Education, Research and Engineering:..... 0.00
The number of undergraduates funded by your agreement who graduated during this period and intend to work for the Department of Defense 0.00
The number of undergraduates funded by your agreement who graduated during this period and will receive scholarships or fellowships for further studies in science, mathematics, engineering or technology fields: 0.00

Names of Personnel receiving masters degrees

NAME

Total Number:

Names of personnel receiving PHDs

NAME

Total Number:

Names of other research staff

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Sub Contractors (DD882)

Inventions (DD882)

Scientific Progress

Technology Transfer

Final Report

Project Title:	Capacity Building for Research and Education in GIS/GPS Technology and Systems
The Proposal No.	64768-CS-REP.
Principal Investigator (PI) and address	Dr. Nitaigour Mahalik, 559-278-2995, e-mail: nmahalik@csufresno.edu Department of Industrial Technology Jordan College of Agricultural Sciences and Technology California State University, Fresno, CA 93740
ARO Grants Officer's Representative	Dr. Liyi Dai, 919-549-4350, e-mail: liyi.dai.civ@mail.mil
AFOSR Co-Grants Officer's Representative	Dr. Tristan Nguyen, 703-696-7796, e-mail, tristan.nguyen@us.af.mil
Award Amount	$496,231
Funded Amount	$496,231 (This grant is issued pursuant to the authority of 10 U.S.C. 2362)
CFDA No.	12.630
Contract No.	W911NF-14-1-0069
Performance Period	1 February 2014 – 31 January 2015

(1) Foreword (optional)

The Deans of the Jordan College of Agricultural Sciences and Technology (JCAST), Fresno (Fresno State) mentioned in the support letter that GIS/GPS technology is key to developing next generation innovations in crop management, robotics, irrigation technology, and vehicle automation. Some of the Deans' statements are mentioned. Besides the IT Department, the GIS/GPS equipment and instrumentation will be useful for faculty, staff, and students in the Plant Science Department, and the Viticulture and Enology Department. Particularly, the Deans envision that the Viticulture and Enology faculty will be pleased to have the equipment and instrumentation to study crop scouting and frost control. As per Deans' the JCAST College has the expertise to maintain the equipment and instrumentation on a long-term basis. The JCAST College is proud to be on the cutting edge of agricultural research and education in the region: "We strive to be current with our instrumentation and equipment to enable our faculty to do groundbreaking research and experimentation in their fields." The JCAST College strives to prepare the students for employment within technical industries. STEM education is very important and this grant augmented the College's ability to provide up-to-date STEM education in a relevant technical area now and in future. Also, the CEO/General Manager of the International Agri-Center at Tulare, Central California (Mr. Jerry Sinift) wrote that he was familiar with the many research projects done by IT Department students at JCAST College. Mr. Sinift experiences conclude that GIS/GPS is a very relevant technical area in the region as it is relevant for precision agriculture, irrigation, transportation, manufacturing, surveying, and navigation. He mentioned that the equipment and instrumentation will allow the department to teach GIS/GPS-integrated technology to its students.

(2) Table of Contents (if report is more than 10 pages)

(3) List of Appendixes, Illustrations and Tables (if applicable)

(a) List of Appendixes

Appendix 1: DMS meeting related documents (Appendix 1a – 1e)
Appendix 2: List of equipment submitted to Department of Defense (DoD) (as mentioned in the proposal)
Appendix 3: Transaction Analysis Report
Appendix 4: Tagging related information of the equipment
Appendix 5: Approval from the DoD to purchase equipment from different vendor/manufacture and computers
Appendix 6: A sample of a sole source justification [for the product SKR0001 (Seekur)]
Appendix 7: CSURMA and AORMA initiative for making available a special aviation liability insurance program
Appendix 8: Questionnaire addressing the usage of UAV purchased through this grant
Appendix 9: Initiatives at the University level in regard to usage of UAV.
Appendix 10: Approval information in regard to Ag Minor where GIS/GPS topics will be taught (as per proposal)

(b) List of Tables (These Tables are within the running text)

(4) Statement of the problem studied

The Department of Industrial Technology (IT) is in the Jordan College of Agricultural Sciences and Technology (JCAST), California State University, Fresno (Fresno State), California. The IT Department offers a spectrum of courses across the fields of applied engineering and technology management. The curriculum focuses on areas such as automation and control, computer networking, information systems, manufacturing, precision agriculture, quality assurance, and transportation. The IT Department's curriculum includes hands-on instruction, research, and scholarly engagements. Through the 2011 Industrial Technology Integration Plan, the IT Department at Fresno State has implemented a new curriculum to meet current needs of the workforce. As Fresno State and the JCAST College plan for the future, the IT Department intended to improve its visibility. The IT Department sets objectives, goals, and competency lists in terms of (i) professional growths of faculty members through research, (ii) research experience for every student, (iii) collaboration among faculty and stakeholders, and (iv) gap reduction between traditional and underrepresented student groups though the department's needs enhancements. To achieve the enhancements, the IT Department needed research and education equipment and instrumentation systems for capacity building.

The IT Department had conducted a survey showing that transfer students (students coming from Community College to 4-year degree institutions, like Fresno State) prefer to receive hands-on, experiential-learning, and research-embedded education for their degrees leading to Bachelor's programs. The Advisory Board of the IT Department suggested that the IT Department must have advanced GIS/GPS (Geographical Information Systems/Geographical Positioning Systems) related courses and topics in the curriculum. GIS/GPS, Unmanned Aerial Vehicle (UAV), Mobile Robot (MR), and SCADA (Supervisory Control And Data Acquisition) components and systems are the equipments and instrumentation systems that are essential and were need to be used for applied research and hands-on instruction in these respect. Besides other areas, the two broad areas of interests were GPS-integrated hybrid Sensing, Surveillance, and Navigation (ISSN) and GPS-based Terrestrial System Modeling and Model Integration (BMMI).

A proposal for capacity building grant for the purchase of equipment and instrumentation systems was written and submitted to the Department of Defense (DoD) for funding. The title of the grant proposal as mentioned on the top of the report is "Capacity Building for Research and Education in GIS/GPS Technology and Systems". The DoD funded the grant to build the capacity. The funding amount was $496,321. The above grant was used to acquire equipment for Fresno State. The main focus is to further the institution's ability to teach and research integrated Geographical Information Systems (GIS) and Geographic Positioning Systems (GPS) technology emphasizing sensing and control. The objectives of obtaining this equipment and instrumentation were to (I) establish an atmosphere for conducting research, (II) create a laboratory for students to improve STEM education, (III) demonstrate new and advanced scientific and technical research results, and (IV) provide interdisciplinary knowledge. The equipment and instrumentation systems will augment the STEM (Science, Technology, Engineering, and Mathematics) instruction by including applied research and hands-on education that can increase critical thinking, data analysis, and instrument manipulation in applied engineering and technology. The equipment and instrumentation need to meet the current workforce demand and

educational need by enabling a curriculum including a great deal of applied science, engineering, and technology pedagogy.

(5) Summary of the most important results

As mentioned, the DoD funded the grant to build the capacity in the IT Department at Fresno State. The funding amount was $496,321. The above grant was used to acquire equipment and instrumentation systems for education and research. As per DoD award/contract, the final report is due 90 days after the end date of the grant. Also, the reporting requirements for Instrumentation Grants (Note: This is an Instrumentation Grant) is that "a final report shall be submitted within 90 days following the end of the specified performance period, or any authorized extension thereto, listing all items of equipment actually acquired by name, manufacturer where possible, cost, and a description of any special circumstances regarding the acquisition of the equipment. The report will also include a concise summary of the research projects on which equipment has been or will be used, including support of (i) the research work described in the proposal and (ii) other research work of interest to DoD." (TECHNICAL REPORTING REQUIREMENTS: For reporting requirements see EXHIBIT B.). In this regard please note that the Performance Period was 1 February 2014 – 31 January 2015. As per EXHIBIT B of the DoD award/contract, this section presents the following sub-sections.

(a) Listing all items of equipment actually acquired by name, manufacturer where possible, and cost
(b) Description of any special circumstances regarding the acquisition of the equipment.
(c) A concise summary of the research projects on which equipment has been or will be used including support of (i) the research work described in the proposal and (ii) other research work of interest to DoD.

(a) Listing all items of equipment actually acquired by name, manufacturer where possible, and cost

As mentioned in the proposal, the grant was used to acquire equipment and instrumentation for California State University Fresno (Fresno State) to further the institution's ability to teach and research integrated Geographical Information Systems (GIS) and Geographic Positioning Systems (GPS) technology emphasizing sensing and control. There are at least three departments that are interested in utilizing the equipment and instrumentation: Industrial Technology, Civil Engineering, Plant Science, and Viticulture and Enology. In summary, the objectives of obtaining this equipment and instrumentation were to (i) To establish a unique and integrated test bed for sustainable use of equipment and instrumentation systems for conducting high-class research in the areas of ISSN and deliver instruction in the topical areas of BMMI; (ii) To create a living laboratory for students and researchers to enable research and outreach programs to improve STEM education in the department, college and university, (iii) To demonstrate new and advanced scientific and technical research results at the national and global levels in real-time experimental settings, and (iv) To provide interdisciplinary knowledge bases in the areas of sensing and control in Command and Agriculture. The outcomes of the above objectives have been presented in appropriate section, especially in (c). Furthermore, the purchasing of the

equipment and instrumentation systems was carried out strictly (i) to meet the goal of the proposal, and (ii) following the policies and procedures.

Strategic discussion, decision making sessions (DMS) and meeting

In order to achieve the objective and goals of the project and facilitate the usage of the equipment and tools to be purchased (and/or purchased) through this grant, several strategic discussion, decision making sessions, and meetings (DMS) were conducted with the department, college, and university staffs, administrators, faculty members of associated departments, and the Director of the research centers for successful implementation of the project. The discussion and decision making includes securing space and necessary amenities, purchasing of the required equipment as per the project proposal that can fit to the curriculum for education and research, updating of the status of the project, usage of the equipment in the respective laboratories, developing platforms for collaborative education and research, development of new laboratories for the students and faculty members to use the equipment for education, research, and community engagements. The Project Investigator (PI) Dr. Nitaigour Premchand Mahalik coordinated all these DMS and meetings. The IT Department faculty members were fully involved in participating in the coordination process as well. The discussions were taking places in the weekly Departmental meetings and sometimes at other forums or meetings as needed. Table 1 lists the some of the important dates on which the strategic discussion, decision making sessions (DMS) and meetings were conducted. Please also note that this is a sample list of meetings and communications. There are several email based communications between the Project Investigator and the stakeholders which were not included in this report.

TABLE 1: Strategic discussion, decision making sessions and meetings dates (Appendix-1)

DMS Date	With whom	Description of the Outcome
02/14/2014	Dr. Charles Boyer (Dean of the College) and Nitaigour Mahalik (PI)	Meeting to acquire lab space to for the usage of the equipment
02/18/2014	Fresno State Grant Manager (Nathan Zanoni) and Nitaigour Mahalik (PI)	Meeting to discuss equipment purchases.
02/20/2014	Chair of department of IT (Athanasios Alexandrou), Faculty members of the department if IT (Don Austin and Arun Nambiar) and Nitaigour Mahalik (PI)	Meeting to identify room IT118 as the storage room for the equipment and instrumentation systems.
02/21/2014	Faculty members of the department of IT (Tony Au; Don Austin; Athanasios Alexandrou; Nitaigour Mahalik (PI); Arun Nambiar; Balaji Sethuramasamyaraja; Daming Zhang)	Discussion regarding development of new lab for the DoD grant project. It was discussed that the PI will use Room IT118 till the area in the new research building becomes available. Part of the AVG and other mobile equipment will be stored in other labs of the College including the Small Engines lab. The College will cover the cost of moving the equipment which is currently in IT118 into another room. The Dean agreed with this arrangement.
02/25/2014	Director of Sponsored Programs (Ellen Shimakawa), Intellectual Property Counsel (Grace Liu), and Nitaigour Mahalik (PI)	To set out grant manager and account for the smooth operation and management of the award/grant
03/04/2014	Agricultural Operations Farm Manager (Michael Mosinski) and	Meeting to discuss storage locations for UAVs

	Nitaigour Mahalik (PI)	
03/05/2014	Fresno State Plant Operation (Gary Wilson) and Nitaigour Mahalik (PI)	Decision making meeting on power supply and amenities requirements
03/12/2014	Faculty of department of IT (Balaji Sethuramasamyaraja) and Nitaigour Mahalik (PI)	To identify the specification of the GIS/GPS hardware and software tools to be purchased for GIS/GPS courses
03/20/2014	Faculty in department of Civil Engineering (Aly Tawfik) and Nitaigour Mahalik (PI)	To discuss about the need of the equipment and instrumentation systems needed for his possible research and education to students in the department of Civil Engineering
03/21/2014	Dean of College of Engineering (Dean Nunna) and Nitaigour Mahalik (PI)	The meeting of the Chair of the department of IT with the Dead of Jordan College of Agricultural Sciences and Technology for possible collaboration between JCAST and Lyles College of Engineering (as per PI's suggestion) held on 02/21/2014 was conveyed to the Dean of the Lyles College of Engineering. The nature of the equipment and instrumentation systems and their characteristic features were identified and explored for joint collaboration between the faculty members and the students.
03/21/2014	Director of CIT (David Zoldoske) and Nitaigour Mahalik (PI)	To identify a space for storage of unmanned ground vehicle (mini-tank type). It was decided to store the vehicle in the Energy building at Wet Lab.
03/28/2014	Faculty in Department of Civil Engineering, Lyles College of Engineering (Fayzul Pasha), and Nitaigour Mahalik (PI)	Preparation of the list of equipment needed for civil engineering department as per project proposal
04/05/2014	Faculty of Department of Civil Engineering (Fayzul Pasha) and Nitaigour Mahalik (PI)	To identify the specification of the pumping and SCADA systems (hardware and software tools) to be purchased for irrigation, monitoring, and automation courses relevant to civil engineering discipline
04/08/2014	Director of CIT (David Zoldoske) and Nitaigour Mahalik (PI)	To develop the procedure for placing the purchase order to purchase the equipment of instrumentation systems through this grant/award (Note: Dr. Zoldoske is one of the signing authorities for placing the order)
08/28/2014	Faculty in Department of Civil Engineering, Lyles College of Engineering (Fayzul Pasha), and Nitaigour Mahalik (PI)	Decision on the list of equipment to be purchased for civil engineering department as per project proposal
10/01/2014	Faculty in Department of Civil Engineering, Lyles College of Engineering (Mustafa Berber), and Nitaigour Mahalik (PI)	Consultation meeting to receive advice for appropriate usage of an equipment (AP-15 IMS)
01/23/2015	Dr. Ram Nunna (Dean of the Lyles College of Engineering) and Nitaigour Mahalik (PI)	Collaborative effort between Lyles College of Engineering and Jordan College of Agricultural Sciences and Technology regarding usage of unmanned aerial vehicles purchased through the DoD grant
02/05/2015	Faculty of Lyles College of Engineering (Dean Nunna, Gregory Kriehn), Faculty of Jordan College of Agricultural Sciences and Technology (Dean Witte, Balaji Seth, Athanasios Alexandrou, Mechel Paggi)	Decision taken to collaborate on Unmanned Systems Laboratory initiative by Lyles College of Engineering and Jordan College of Agricultural Sciences and Technology (This was the follow-up to meeting with the Dean of the Lyles College of Engineering on 01/23/2015)
4/17/2015	Nitaigour Mahalik	Presented poster "Interdisciplinary State-of-the-Art Technology Systems for Agriculture and Military Applications" at Fresno State President's Showcase of Excellence 2015

Categories and the List of Equipment and Instrumentation Systems

The purchasing of equipment was carried out based on the request made in the grant proposal that was submitted to the Department of Defense (DoD). In the proposal, we wanted to purchase the type of equipment and instrumentation systems as per our program and curriculum needs. Therefore, in the proposal we had listed the needed equipments to be purchased. The purchasing is now over. All the purchases were achieved during the performance period which was February 1, 2014 to January 31, 2015.

The equipment and instrumentation systems thus already acquired are categorized under three groups as described as Geographical Information Systems (GIS) and Geographic Positioning Systems (GPS) components and systems, Unmanned Aerial Vehicle (UAV) and MR (Mobile Robot) components and systems, and SCADA (Supervisory Control and Data Acquisition) components and systems. Table 2 details the list of equipments and instrumentation systems purchased through this grant. We purchased the equipment only those have been listed in the grant proposal (See Appendix-2) that was submitted. This report also includes a Transaction Analysis Report in Appendix-3 that shows the vendors we have paid for the purchase of the equipment and instrumentation systems in a standard format that our University uses. At this point it is worth to mention that the University (Fresno State) has a Policy for Purchasing the Equipment and Auditing procedure. The existing Fresno State policy was followed throughout the purchases. It is detailed in the next sub-section (i.e., after the Table 2).

TABLE 2: List of equipments and instrumentation systems purchased

Sl No #	List of items of equipment	Name of manufacturer	B	C
1	210-AAWJ Latitude E7440	Dell	1,294.22 (1)	**1,734.47 + 15,200.24 + 512.46 = 17,447.07**
	451-BBCT Primary 4-cell 47W/HR Battery	Dell	36.75 (1)	
	338-BEOS 4th gen Intel Core i5-4310U Processor (2.0Ghz, 3M cache, Dual Core)	Dell	138.60 (1)	
	452-BBBI E-port dock for charging, digital video, and USB 3.0 /eSATA port support	Dell	126.75 (1)	
	325-BBCL Light sensitive webcam and noise cancelling digital array mic	Dell	18.90 (1)	
	391-BBFB 14.0 FHD (1920x1080) Wide View Anti-Glare WLED-backlit	Dell	119.25 (1)	
2	210-AAWJ Latitude E7440	Dell	1,239.34 (11)	
	338-BEOS 4th gen Intel Core i5-4310U Processor (2.0Ghz, 3M cache, Dual Core)	Dell	125.40 (11)	
	325-BBCL Light sensitive webcam and noise cancelling digital array mic	Dell	17.10 (11)	
3	860-BBCG Dell UltraSharp 24 Monitor – U 2414H	Dell	240.49 (2)	
	331-9597 DELL USB KB, English, Dell Precision OptiPlex, and Latitude Customer Install	Dell	14.99 (1)	

	331-5076 Dell USB Laser 6-Button Mouse, OptiPlex and Precision Desktop, Customer Install	Dell	16.49 (1)	
4	75839 Breadboard digital lab	Jameco	469.95 (5)	**3875.72**
	198678 Meter, LCR, Passive Computer	Jameco	209.99 (3)	
	2159402 Sensor, Humidity/Temp, Arduino	Jameco	18.95 (20)	
	2159381 Sensor, Soil Moisture, Arduino	Jameco	4.95 (50)	
	20626 Kit, Adjustable Power supply	Jameco	26.95 (10)	
5	40100 AP15 with standalone PCS	Applanix	25,500.00 (1)	**(33,342.49 +14,393.18 = 47,735.67)**
	40100 POSPac MMS V7.x, Node-Locked Software license	Applanix	15,340.00 (1)	
	10004367-10 Maint GNSS-INER W/SP no GNSS Key	Applanix	2700.00 (1)	
	10004367-17 Maint POSGNSS Tool Set	Applanix	200.00 (1)	
6	1003B-10142 Hyperspec® VNIR A-Series	Headwall Photonics	22,050 .00(1)	**48,870.00**
	1004A-21444 17mm, F/1.4, 400-1000nm	Headwall Photonics	1170 .00(1)	
	1005A-31180 Hyperspectral Data Processing Unit	Headwall Photonics	11,250.00 (1)	
	1003B-30048 Hyperspec® Pan and Tilt	Headwall Photonics	14,400.00 (1)	
7	96900-91 Trimble WM-Topo Survey System W/ AGGPS 542 Base & Farmworks surface soft. WM-Topo Solution Kit	Laserman	17,995.00 (1)	**33,070.00**
	90510-90 AGGPS542 GNSS Mobile base	Laserman	11,995.00 (1)	
	5301-20-ORG TRIPOD,HD, OUICK, CLAMP, ALUM	Laserman	130.00 (1)	
	88502-10 Farm Works-surface	Laserman	2,950.00 (1)	
8	Centrifugal flow/programmable process control system	Turbine Technologies	31,915.25 (1)	**31,915.25**
9	ISTK-NANO-10 Nano-10 Starter Kit	Triangle Research International	229.00 (1)	**4,354.00**
	Nano-10 10 I/O Ethernet Control	Triangle Research International	119.00 (19)	
	FMD88-10 Ethernet I/O Controller	Triangle Research International	215.00 (10)	
	FP4030MR 3.1” Graphical HMI with keypad	Triangle Research International	119.00 (5)	
	USB A-B	Triangle Research International	5.00 (5)	
10	8350-0746-02 WSN-OEM2110CB	MEMSIC	3,595.00 (1)	**3,595.00**
11	8350-0724-05 WSN-PRO2400CB	MEMSIC	2,195.00 (1)	**2,195.00**
12	TRM6578011 Juno 3B Handheld w/ software	California Surveying and Drafting Supply	10,995.00 (1)	**10,995.00**
13	60910-03 Trimble BD910 OEM M odule GPS, L1, Autonomous/SBAS, 20Hz	Terris GPS	1,295.00 (1)	**3,538.75**
	87062-00 Trimble BD910/920	Terris GPS	690.00 (1)	

	Evaluation Kit			
	83553 Trimble AV33 L1/G1 Aviation Antenna	Terris GPS	495.00 (1)	
	58957-05-INT Trimble 5m TNC-TNC Antenna Cable	Terris GPS	125.00 (1)	
	84902 Trimble AV33/34 Antenna Mounting Bracket	Terris GPS	125.00 (1)	
	86362 Trimble AV32 L1/L2/G1/G2 Aviation Antenna	Terris GPS	995.00 (1)	
14	90775-65 Trimble BD920-W3G OEM Module, 3G, WiFi, GPS, GLN, GAL, L1, E1, DGPS, 20Hz	Terris GPS	3,545.00 (1)	**4,260.75**
	92929-00 Trimble BD920-W3G Evaluation Kit	Terris GPS	690.00 (1)	
	58957-05-INT Trimble 5m TNC-TNC Antenna Cable	Terris GPS	125.00 (1)	
	84902 Trimble AV33/34 Antenna Mounting Bracket	Terris GPS	125.00 (1)	
15	RB-INS-05 ZOMBY Remote Controlled Tracked Platform	RobotShop	19,995.00 (1)	**23,060.30**
	RB-MES-01 MESA Imaging 3D ToF Camera SR4000 (USB, 5m range)	RobotShop	4,279.00 (1)	
16	RB-Vik-01 RTX-X! FPV Quadcopter UAV	RobotShop	2,400.00 (5)	**11,172.00**
17	RB-Cro-02 MicroPilot MP-Vision UAV Glider	RobotShop	9,500.00 (2)	**13,298.10**
18	P3T5001 5 pack P3-AT Robots	Adept Mobile Robots	27,995.00 (1)	**59,990.00**
	ACT0112 Onboard 2.26 GHz MAMBA Computer	Adept Mobile Robots	3,775.00 (5)	
	ACT0036 High Speed Wireless Ether PKG	Adept Mobile Robots	945.00 (5)	
	ACAT031 P3-AT Front Sonar Ring	Adept Mobile Robots	375.00 (5)	
	ACAT032 P3 AT Rear Sonar Ring	Adept Mobile Robots	470.00 (5)	
	ACA0056 Indoor Wheels for P3AT	Adept Mobile Robots	475.00 (5)	
	ACT0088 Case of 10 7 AMP/HR Battery	Adept Mobile Robots	395.00 (1)	
	ACT0072 High-Capacity Charger 110/220V	Adept Mobile Robots	280.00 (5)	
19	PLX0001 Pioneer LX	Adept Mobile Robots	31,995.00 (1)	**31,995.00**
20	SKR0001 Seekur Robot Base	Adept Mobile Robots	69,995.00 (1)	**104,823.00**
	ACT0300 Seekur PC #1	Adept Mobile Robots	5,946.00 (1)	
	SOF0004 Linux Software Install	Adept Mobile Robots	195.00 (1)	
	ACT0330 Seekur Wireless Ethernet	Adept Mobile Robots	1,696.00 (1)	
	ACT0360 Seekur Outdoor Navigation	Adept Mobile Robots	26,991.00 (1)	
21	Remote Control, Battery, Charger, Electronic Devices	HobbyTown	887.39 (1)	**887.39**
22	Remote Control, Battery, Charger	HobbyTown	774.76 (1)	**774.76**

B= Unit amount (quantity); C= Total price paid to that manufacturer/vendor as per one Invoice (some invoices exclude used taxes, freight, shipping, handling, and other fees). Detail report can be seen from Appendix 3 (Transaction Analysis Report)

Procedure followed in Purchasing the Equipment and Instrumentation Systems

Fresno State is one of the 23 campuses in the California State University System in the State of California. The purchasing is auditable through federal and state regulations. At Fresno State, in order to purchase equipment costing over $5,000 we need at least 3 Quotes from three different vendors with validity date for the Quote. The Quotes are compared and the decision is made in order to purchase the equipment based on the requirement. One of the roles of PI was to identify specification, features, characteristics (SFC) of the equipments and instrumentation systems to be purchased and make sure these SFC of the equipment and instrumentation systems from the manufacturers/vendors. Please also note that Fresno State Purchase and Procurement Policy required tagging the equipment with a Foundation (California State University, Fresno Foundation) asset tag for an item that costs more than $5,000. Appendix-4 lists all the equipments and the tag number that was pasted by the Foundation.

(b) Description of any special circumstances regarding the acquisition of the equipment.

(i) Appendix-2 mentions the list of equipment needed to be purchased as per proposal submitted to the DoD on July 7, 2013. At this point this report would like to mention that (1) we were able to purchase almost all the equipments (as listed in Table 2) that we had listed in Appendix-2 and some of them are integrated in nature and purchased from different vendors/manufacturers, and (2) we purchased additional dedicated laptop computers that was not requested as per Appendix-2 [The dedicated computers would enhance the capacity and scope of education and research. We then can have a full-scale dedicated living-lab room for the student researchers and faculty. These laptops will significantly enhance the DoD-relevant research program activities.]. The respective reasons (1. not purchasing all of the equipment and instrumentation systems from the manufacturer/vendors; and 2. additional computers) were that (1) a couple of vendors were either not supplying the equipment/system or the price is much higher than the requested amount. We solved this issue by purchasing integrated equipments (i.e., instead of purchasing multiple equipment we purchased one equipment containing the needed specifications of multiple items) from different vendor(s) without compromising the purpose and quality, (2) we had procured many equipment and software systems such as mobile robots, UAV, remote sensing systems, etc. as per the proposal. In the proposal, it was proposed to develop a living-laboratory. In the living-lab many of the DoD equipment and software systems will be interfaced with the computers for their use and operation. These equipments and software systems needed computers for their full-scale operation and usage. Earlier, the plan was to interface these equipment and software systems with our existing computers which are available in one of the labs in the IT Department. However, those computers are old, and being used for general purposes, and sometimes they are not available whenever the students or researchers need them to work with DoD equipment and software systems in the living-lab room. In that respect, it was required to purchase dedicated computers to interface with these equipments and software systems. It was therefore requested the ARO Grants Officer's Representative (Dr. Liyi Dai, 919-549-4350, e-mail: liyi.dai.civ@mail.mil) and AFOSR Co-Grants Officer's Representative (Dr. Tristan Nguyen, 703-696-7796, e-mail:

tristan.nguyen@us.af.mil) to purchase some laptop computers through this grant at a later time, i.e., after the grant was awarded. In the request it was assured that (i) the laptop computer will not be used for general-purpose activities (as per DoD requirement) but be used to support DoD-relevant research and education program purpose. Both of our requests (1) & (2) were approved. Please see Appendix-5. Note that we were not requesting for any additional cost for the above two requests. We were eventually successful in purchasing the equipments from different vendors without compromising the quality, the required purpose. We also purchased 12 laptop computers as additional equipment/system.

(ii) As mentioned, the University (Fresno State) has a Policy for Purchasing the Equipment and Auditing process. The existing Fresno State policy was followed. To purchase an equipment costing over $5,000 we need at least 3 Quotes from three different vendors with validity date. The Quotes are compared and the decision was made to purchase the equipment based on the requirement. Some of the equipments are unique in features and characteristics. So, quotations comparison is not applicable to those equipments. As a result, we answer "Sole-Source Justification" with the questionnaire (a) What are the unique performance features of the product or brand requested that are not available in any other product or brand? (b) Why are the unique features required?, and (c) What other items or brands were evaluated, rejected, and why? A sample of the "Sole-Source Justification" vs. Questionnaire is attached as Appendix-6 in this report.

(iii) This award/grant includes purchasing of Unmanned Aerial Vehicles (UAV). Because of significant risks to the University and its Auxiliary Organization such as CSURMA (California State University Risk Management Authority) and AORMA (Auxiliary Organizations Risk Management Alliance), they are now making available a special aviation liability insurance program (Appendix-7). As a result, there is a Questionnaire that was required to be completed and returned to our insurance company. As the PI of the Project, I had completed the Questionnaire thoroughly addressing each question with respect to the newly purchased UAV's though this award/grant and had sent it to the Foundation/Auxiliary as can be seen from the Appendix-8. Several initiatives in this regard have already been taken and taking place at the institution levels. Please refer Appendix-9.

(c) A concise summary of the research projects on which equipment has been or will be used including support of (i) the research work described in the proposal and (ii) other research work of interest to DoD.

(i) The objectives (I) and (II) mentioned in the previous Section, (Section (4) Statement of the problem studied) have already been achieved. The objectives mentioned in (III) and (IV) are considered as the long-term achievements: meaning, the outcome of the objectives mentioned in (I) and (II) will be used to accomplished (III) and (IV).

The acquired (already purchased during the Performance Period of this grant award) equipment and instrumentation systems will advance research of interest to DoD. For

example, they will advance ARO relevant knowledge on the interaction between weather, terrain, and control systems. Similarly, the acquired equipment and instrumentation systems will advance AFOSR relevant knowledge on signals communication. Most importantly, the acquired equipment and instrumentation will enhance ability of our Department, College, and the University to have students pursue degree programs embedded with STEM (Science, Technology, Engineering, and Math) skill set or knowledge base. There were no special circumstances regarding the acquisition or installation of the equipment that were purchased. JCAST College routinely can maintain the equipment and instrumentation systems, and is committed. Also, as mentioned in the proposal, no special training was needed either for the PI or faculty member and staff to use the equipment and instrumentation systems. In summary, the tangible outcomes are listed below.

1. The purchased equipment and instrumentation systems (see Table 2) will increase department, college, and university's capabilities to teach Geographical Information Systems (GIS) and Geographic Positioning Systems (GPS) technology. The purchased equipment and instrumentation systems interfaced with existing resources and upgrade facilities and the equipment and instrumentation systems currently available. The acquired equipment and instrumentation will augment existing education and research capabilities. Fresno State's IT Department now can prepare students for careers in the needed fields to add on to the workforce. Thus, the IT Department's capabilities have been augmented. The IT Department has already planned to create GIS/GPS topic courses to introduce students to precision mapping and navigation technology. Other departments and institutions will have access to the procured equipment and instrumentation systems: Plant Science, Viticulture and Enology, and Civil Engineering departments' capabilities will also be augmented.

2. The IT Department has already developed a Minor Program and it has been approved by the University and become available to the students since Fall 2014 It is called "Ag Minor" (Appendix-10) and includes the courses such as IT 52: Basic Electricity and Electronics; IT 116: Data Collection and Analysis; IT 156: Electric, Hydraulic and Pneumatic Motor Control; IT 186: Precision Agriculture/Site-specific Crop Management; and IT 19X: Project/Independent Study/Co-op (190/194/199). The PI of this Project had initiated to develop the Ag Minor program in the IT Department and it is now being implemented. The faculty members of the IT Department have full support of the program. The contents of some of the courses in the Ag Minor mentioned above include GIS/GPS technology and systems. Some of the contents are "Survey of geo-spatial technologies, e.g. geographical-information-system and global positioning system. Applications of GIS/GPS, remote sensing, imaging technology and geo-database in fields of logistics, agriculture and business. Spatial information management for precision agriculture, agriculture business, food system and public policy". These are the modified courses with new contents and new research contexts that have been developed based on the suggestions outlined in the DoD proposal. The courses are taught to

undergraduate and graduate students. Our class size in each course is about 24-30. The above courses would be taught in every semester. Also, the graduate and undergraduate students will enroll in IT 190, IT 199, IT 290, IT 298/299 where they will have opportunity to use the equipment and instrumentation systems to pursue research in the fields mentioned in the proposal.

3. The areas of research and types of research projects on which the equipment and instrumentation systems will be used are (A) Multi-sensor, multi-algorithm, complex network based secured communication strategy (MMCC). In multi-sensor area Wireless Sensor Networking (WSN) fields will be explored. As a step forward the research to be conducted in WSN field is to develop range-based algorithms to deal with the optimal energy usage. This area will explore WSN in an integrated scenario (GPS-RFID-WSN integration) and inter-symbol interference modeling and handling through simulation and real-time dynamic environment, (ii) Security and data encryption algorithm for GPS-WSN platform in real-time dynamic environment, and (iii) Literature study and exploration of GPS-WSN in underwater communication scenarios. Multi-algorithm area will explore several fusion algorithms through bio-inspired data analysis methods, data mining approaches with performance studies. The concept of algorithm fusion will be explored for making a decision based on multiple sensor data in WSN and GPS-WSN. Also, it will include development of optimal collaboration algorithm and scheduling procedure for transmission of data in GPS-WSN. In complex networks area, literature study for the dynamic environment will be carried out. The parameters of complex network for the dynamic environment for various cooperative engagement applications will be attributed. Also, modeling of complex network for GPS-WSN will be accomplished. The research includes advanced cross-layer model and architecture. In regards to security and communication, low-bit high-performance encryption technique utilizing GIS database for the dynamic environment will be developed for improvement in security, and the development of multi-channel multiplexing algorithm, and SNR study for the dynamic environment will be accomplished; (B) Geo-referencing (GR), precision target tracking and noise elimination (PTTNE): The GR research and education will be on GNSS (Global Navigation Satellite System) denied environments, position and orientation study for geo-referencing solution for remote sensing systems of dynamic environments (terrestrial, airborne and marine). The process will be modeled using geodetic co-coordinate system (GCS). In PTTNE, process and measurement noise elimination, and precision target tracking using families of Kalman filters (PEPT). Nonlinear constraints will be studied and tackled. Family Kalman filters techniques will be used to deal with process noise, measurement noise, nonlinearity in object tracking as well as navigation. GCS will be considered in the filtering process.

   As per proposal, the PI of this Project has developed the basis for imparting education and research in the areas of GIS/GPS technology in the IT Department so that capacity will further be enhanced through interactive and collaborative processes and methods. Some of the collaborative efforts are listed in Table 1.

More courses and course contents will progressively be developed and augmented, respectively. As mentioned in the proposal, respective faculty members will allow the students to pursue education and research using the courses IT 191T, IT 284, IT 286, IT 290, and IT 298. Recently, courses IT 282 (Advanced Communication and Visual Presentation) and IT 280 (Research Methods) were used to pursue education and research in the areas of GIS/GPS technology and their applications as cited in the proposal or in other words, to meet the goals and objectives of the award/grant. Some of the topics that the students conducted preliminary research through these courses are listed below.

TABLE 3: Research Assignment Topics in the Courses IT 282 and IT 280

Study on Frost Control in Agriculture
Using Technology for Crops Scouting in Agriculture
Application of Technology in Precision Agriculture
Wireless Sensor Network (WSN) in Cooperative Engagement Capability
Range based algorithms for Wireless Sensor Network
Self-configurable Wireless Sensor Network
Energy Efficient Wireless Sensor Network
Maintaining sleep-mode algorithm in Wireless Sensor Network
Application of GPS in Wireless Sensor Network
Application of RFID in Wireless Sensor Network
Inter-Symbol Interference in Wireless Sensor Network
Security and data encryption algorithm for GPS platform
Security and data encryption algorithm for Wireless Sensor Network platform
Security and data encryption algorithm for GPS-Wireless Sensor Network platform
Study and exploration of GPS in underwater communication scenarios
Study and exploration of Wireless Sensor Network in underwater communication scenarios.
Protocols for Wireless Sensor Network
Fusion Algorithm for Wireless Sensor Network
Bio-inspired data analysis methods in Wireless Sensor Network.
Application of data mining in Wireless Sensor Network.
Study on performance issues in data mining approaches
Sensor Fusion and Fusion Algorithm in GIS/GPS System
Using Technology for Crops Scouting in Agriculture
Application of Technology in Precision Agriculture
Wireless Sensor Network (WSN) in Cooperative Engagement Capability
Inertial and non-inertial navigation methods
Spectral estimation in the presence of external corrupting factors in image processing
Study on surveillance images
Energy efficient Wireless Sensor Network
Signal communication in Battle space
Modeling geodetic co-coordinate system (GCS)
Spatial Simulation
Global Navigation Satellite System for denied environments
Precision target tracking
Noise elimination using Kalman Filter
Terrestrial system modeling and model integration
Application of machine learning in geodetic analysis
Theory, methods, and models for geographic analysis
Traceability technology in food packaging and supply chain
Efficient resonant coupled wireless power transfer systems

ii. Within the IT Department, as expected, faculty members, graduate and undergraduate students are benefiting from this award/grant. Research experiences and publications are already taking place at the local level. Our student enrollment has increased about 15%. As mentioned in the proposal, the estimated useful lives of the equipment and instrumentation systems are 10-15 years with proper updating. The mobile robots will last for 10-15 years. The equipment and instrumentation systems that have been purchased are of two kinds: hardware and software. The hardware components are of three types: mechanical, electronic, and combination of both. The mechanical parts (e.g., mobile robotic base platform) of the equipment are the bases on which the electronics and other devices such as camera, GPS, computer etc. are already integrated. The bases integrated with the devices already purchased through this award/grant are useful for research for at least 5 years. In the future, bases can be updated to accommodate the latest version of the devices (if needed) to conduct experiment and research. Similarly, the software will be upgraded as needed. While using the equipments and instrumentation systems to their fuller extent based on the existing programs, in near future (in 1-2 years) we will continue to update and augment new contents to our existing programs/courses for further enhancements. Some of the topics that we have decided to include are Geo-spatial technologies, GIS (Development of data dictionary and indexing project), GPS (Loading of dictionary and path into the GPS receiver), GIS/GPS tools (Resource check: satellite availability, link, etc.), Application of GIS/GPS to geo-database (Working with base station in real-time), Remote sensing: An application of GIS/GPS to precision agriculture (Gain knowledge on performing procedures for mapping points, lines and areas in crops field), Application of GIS/GPS to water and field mapping, Communications (Understand GPS communication theory on wireless networking and frequency standards and GSM), Imaging technology (Including spatial analysis and modeling), Electronics and Instrumentation, Automated systems, control and navigation, Supervisory Control and Data Acquisition (SCADA), Application of GIS/GPS for SCADA, Real-time systems, instrumentation and control, Sampling, scouting and field mapping, and Yield monitoring and mapping. Please note that these topics are already there in our curriculum, however, our goal will be to update the contents to meet the state-of-the-art skill set and knowledge base (Please note that our Department has evolved from Industrial Arts to Industrial Technology).

(6) Bibliography

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(6) Appendixes

Appendix 1: DMS meeting related documents (Appendix 1a – 1e)

Appendix 2: List of equipment submitted to Department of Defense (DoD) (as mentioned in the proposal)

Appendix 3: Transaction Analysis Report

Appendix 4: Tagging related information of the equipment

Appendix 5: Approval from the DoD to purchase equipment from different vendor/manufacture and computers

Appendix 6: A sample of a sole source justification [for the product SKR0001 (Seekur)]

Appendix 7: CSURMA and AORMA initiative for making available a special aviation liability insurance program

Appendix 8: Questionnaire addressing the usage of UAV purchased through this grant

Appendix 9: Initiatives at the University level in regard to usage of UAV.

Appendix 10: Approval information in regard to Ag Minor where GIS/GPS topics will be taught (as per proposal)

Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology
Friday, January 16, 2015
Spring 2015 Opening Meeting Minutes

Call to order: by Dr. A. Alexandrou, Department Chair
Members Present:, D Austin, N. P. Mahalik, A. Nambiar, B. Seth, M. Yen, D. Zhang, C. Fitz Gibbon
Members Absent: T. Au (FERP)
Approval of Today's Agenda– approved with a few additional items.
Minutes of 12.2.14 – approved.
Minutes of Winter Retreat on 12.9.14 – A sentence was stricken out in the New Business.

Communications

- Dr. Alex reiterated items from Administrative Council meeting, i.e., Dean's focus on Ag Commission's recommendations, specifically improvements needed for JCAST to reach its potential: item f – Improve classroom quality, …Improve laboratory facilities. Renovate JCAST facilities…in the Grosse Industrial Technology Building. – *Please respond action items before the next meeting on Thursday, 1/22/15*.
- Dr. Alex has a meeting with Dr. Bushoven and Dr. Nef to review the IT labs and their usages; he is proposing to bring in AgM equipment to IT labs to consolidate space. He also requested faculty's input on 1) the Jordan Research Center lab space policy modification and 2) equipment and other needs list – *Action items 1 & 2.*
- Farm Manager position announcement is being drafted and search committee is being formed; UAL vehicle policy modification is being made.
- Dr. Alex would like to request for a new search (deadline to Dean 2/5/15): 1 f/t faculty and 1 ½ time technician to share with Plant Sci. Dept. – *Action item 3*.
- Dr. Alex and Don will be meeting with Dr. Reid regarding IT program accreditation.
- IT Spring 2015 banquet is on Tuesday, April 14.
- IT 404 remodeling plan has been shared: it is to be a classroom/lab combination; old computers from IT 404B have been removed and the sink is to be covered; old equipment to be surplused; Dr. Mahalik would like all computers back on the tables in F15.
- IT 110D remodeling fund was approved by the Dean's office – work is to be commenced soon.
- Don announced the upcoming UCAM Conference on May 7, 2015, location TBA.
- Dr. Seth announced that RSA Conference is on April 22nd.
- Dr. Nambiar explained the group of MSIT students who transferred last spring needs 200 level courses to graduate this spring and requested faculty to allow extra seats in their classes. Dr. Alex asked Graduate Coordinator to confirm that MSIT program admit transfers with min. 2.5 GPA in the future.

Old Business

- Faculty reviewed and recommended some changes on the new BSIT option – Agricultural Systems Management, i.e., add IT 117, add 'W' course (IT 198W or Plant 105W), require COMM 7 and MATH 45. Justification for the new option would be to provide students more hands-on, managerial/leadership, engineering technology, business management systems program at no extra costs.

- Dr. Alex announced the LCOE/JCAST common lab, IT 158, is to be the Unmanned Systems Laboratory to house Dr. Mahalik's DOD project equipment after 1/31/15. He is proposing a meeting with Dr. Witte, Nuna, Seth, Kriehn and Mahalik to draft a policy. Dr. Mahalik recommended Dr. Seth be the Coordinator of the UAV project/initiative, since he is already coordinating the Process Control Initiative.
- Faculty discussed and reaffirmed the need to offer face-to-face course alternately with online courses; The Department decided that IT 131 will be offered in hybrid mode in F15.
- Dr. Mahalik mentioned the need to keep an identity for the Department.

New Business

- The Department has no comment on the memo by G. Andrew Jones's related to UAV programs at CSU.
- As discussed in the Communications above, Dr. Alex requests faculty input on the lab usage analysis (*Action item 4*), the Jordan Research Center policy modification and equipment and other needs requests.

Next Meeting Date & Time: Thursday, 1 p.m.
Adjourned: at noon
Recorder: C. Fitz Gibbon

Appendix 1b

Zimbra **nmahalik@csufresno.edu**

Unmanned Systems Laboratory Initiative - revised time/day

From : Christina Fitz Gibbon <christif@csufresno.edu> Tue, Jan 20, 2015 03:06 PM

Subject : Unmanned Systems Laboratory Initiative - revised time/day 1 attachment

To : Ramakrishna Nunna <rnunna@csufresno.edu>, Gregory Kriehn <gkriehn@csufresno.edu>, Sandra Witte <sandraw@csufresno.edu>, Balaji Seth <balajis@csufresno.edu>, Athanasios Alexandrou <aalexandrou@csufresno.edu>, Prem Mahalik <nmahalik@csufresno.edu>, Mechel Paggi <mpaggi@csufresno.edu>

The following meeting has been modified:

Subject: Unmanned Systems Laboratory Initiative - revised time/day [MODIFIED]
Organizer: "Christina Fitz Gibbon" <christif@csufresno.edu>

Location: IT 220
Time: Thursday, February 5, 2015, 3:00:00 PM - 4:00:00 PM GMT -08:00 US/Canada Pacific [MODIFIED]

Invitees: rnunna@csufresno.edu; gkriehn@csufresno.edu; sandraw@csufresno.edu; balajis@csufresno.edu; aalexandrou@csufresno.edu; nmahalik@csufresno.edu; mpaggi@csufresno.edu

~~*~*~*~*~*~*~*~*~*

Dr. Alexandrou is proposing a meeting between LCOE and JCAST. If you can't meet at this time, please let us know of your available time/day. Thank you.

meeting.ics
4 KB

Appendix 1c

Zimbra **nmahalik@csufresno.edu**

Unmanned Systems - JCAST

From : Ram Nunna <rnunna@csufresno.edu> Fri, Jan 23, 2015 12:53 PM

Subject : Unmanned Systems - JCAST

To : Athanasios Alexandrou <aalexandrou@csufresno.edu>

Cc : Sandra Witte <sandraw@csufresno.edu>, Prem Mahalik <nmahalik@csufresno.edu>

Reply To : Ram Nunna <rnunna@csufresno.edu>

Hello Alex,

I had a chance to talk to Dr. Mahalik today, and we walked over to IT 158 and I showed him how we are presently using the space. He also took me to his lab in the IT-tower building and showed me all the equipment that he has acquired through his grant. I learned more about the technical capabilities of the systems that he has acquired. There are many interesting projects that could be designed and there are many research opportunities.

I too invited Dr. Mahalik to join our meeting on exploring collaborative activities between LCOE and JCAST in unmanned systems.

Looking forward to our meeting that is coming up. I hope all the invitees can make it.

Ram Nunna

CC: Dr. Witte, Dr. Mahalik

Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology
Wednesday, March 12, 2014 **Meeting Minutes**

Call to order: by Dr. A. Alexandrou, Department Chair
Members Present: T. Au, D. Austin, N. Mahalik, A. Nambiar, B. Seth, D. Zhang, C. Fitz Gibbon
Member Absent: Dr. Yen (FERP)

Approval of Minutes of March 5, 2014 – approved.
Approval of today's Agenda – approved with additions.

Communications

- TILT nomination of Dr. Nambiar for the Provost's Award - Technology in Education.
- Non-Land Grant College of Agriculture Capacity Building Grants – Dr. Seth is submitting a proposal; however, only two applications will be funded by the sponsor.
- Dr. Alex reminded faculty that JCAST is preparing a policy on 50% online classes.
- Release Time request for research is due 3/14/14.
- From the JCAST Budget Committee - D. Austin informed that the College has fund for hiring technicians for lab intensity classes such as IT. Although the dept. is the recipient of the new computers in room IT 512, this would be a great opportunity to request for a full time technician to help prepare for labs and maintain equipment.
- Dr. Alex informed that the Dean would like the College to utilize the proposed Student Success fund ($100/yr. and student).
- CFG informed that there are 127 BSIT and 48 MSIT students in the program and for fall 2014, 27 BSIT students are admitted.
- Dr. Alex informed that the FFA contest advisors will be receiving jackets this year.

Old Business

- Faculty nominated Colton Andersen for the Dean's medal (BSIT). For the Graduate Dean's medal, the dept. has already nominated Minh Le.
- Lab cleaning – 5S Day – on two Fridays this spring to organize labs. Faculty to recruit student volunteers, lunch will be provided.
- Faculty were informed of the need to offer two sections of IT 115 this fall due to influx of the PBAC students this spring. They (15 students) all need IT 115 as prerequisite to MSIT program. Faculty suggested restricting one section just for the MSIT students.
- The dept. will offer IT 52 and IT 116 in F14 and offer IT 156 and IT186/286 next spring for the new Ag Precision Minor. Dr. Nambiar has agreed to teach IT 116 in the fall and release his section of IT 198W for a part time faculty.
- IT 106 in the fall will be a Tablet course in room IT 119. The conversion of the room may run into a problem changing from IT student office to a lecture room. The facilities office informed us that an architect will need to review the room and the conversion request will have to be approved by the Dean and the Provost. Also the cost of moving furniture from IT 118 and the remodeling of IT 119 may be as high as $2,000 which the dept. doesn't have.
- Dr. Nambiar is offering an online IT 106 this summer in order to help minimize the class impaction this fall. Also the fall IT 106 section is a Tablet class which will be offered to the entire university and it would seem necessary to offer the summer session for IT students.

New Business

- Faculty agreed that it is a good idea to request students to submit supervision proposals (abstracts) a semester prior to their actual registration. This is to help students organize their class loads and to help balance faculty load before the semester begins.
- Dr. Alex expressed that he would like each faculty load to be no more than 12 WTUs.
- Dr. Mahalik offered equipment purchase for the Ag Minor program from his DOD grant.
- CFG requested faculty to nominate students for the banquet awards.

Next Meeting Date & Time: Wednesday, March 19, 2014 @ 10:00 a.m.
Adjourned: at 11:00 a.m.
Recorder: C. Fitz Gibbon

DEPARTMENT OF INDUSTRIAL TECHNOLOGY

A G E N D A
Department Faculty Meeting
March 19, 2014 @ 10:00 a.m., Room IT 220

1. **Call to order**

2. **Communications**
   - FFA Officers Luncheon – Tuesday, 4/15/14, @ Smittcamp
   - Other

3. **Old Business:**
   -

4. **New Business**
   -
   - Other

5. **Adjourn**

Appendix 1e

Zimbra **nmahalik@csufresno.edu**

Re: Space for DoD

From : Athanasios Alexandrou <aalexandrou@csufresno.edu> Thu, Jan 15, 2015 04:19 PM
Subject : Re: Space for DoD
To : Prem Mahalik <nmahalik@csufresno.edu>
Cc : Sandra Witte <sandraw@csufresno.edu>, Mechel Paggi <mpaggi@csufresno.edu>

Dr. Mahalik,

Thank you for your clarification.

I do understand that shortly after the termination of the project the equipment will be transferred to the university at which point the university or its unit (College/Department) will be responsible and decide for its use and storage.

Best regards,

Alex

A. Alexandrou, Ph.D
Professor and Chair, Department of Industrial Technology
California State University - Fresno,
2255 E. Barstow Av. MS IT 9
Fresno, California 93740
Phone: 559-278-2145, Direct: 559-278-1951
Fax: 559-278-5081

From: "Prem Mahalik" <nmahalik@csufresno.edu>
To: "Sandra Witte" <sandraw@csufresno.edu>, "Athanasios Alexandrou" <aalexandrou@csufresno.edu>
Cc: "Mechel Paggi" <mpaggi@csufresno.edu>
Sent: Thursday, January 15, 2015 2:29:22 PM
Subject: Space for DoD

Dr. Witte and Dr. Alexandrou,

As you know, we have now 500,000 worth of several high-tech equipments and tools that are recently purchased through DoD's Sense and Control using GIS/GPS Project grant, and they are currently housed in the Room IT 118. Now, the purchase of equipment is over and the Project is going to end on 1.31.2015. Once the project is over, the equipments needs to be installed for education and research purposes in the department/college. For this, adequate space is necessary. Some of the equipments (e.g., the big Mobile Robot and the Mini Zomby tank) can be

housed in the Jordan Research Building as directed by Dean Boyer. So, they will temporarily stay in the Room IT 118 until the Building is over. Besides Room IT 118, I need some bigger space to install other equipments to be used for the purpose.

I was wondering if Room IT 404 can be spared for this. If you have any other alternative that will also do.

Thank you.

Nitaigour "Prem" Mahalik, Ph.D.
(Associate Professor)
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http://www.fresnostate.edu/jcast/indtech/index.html
http://badging.societyforscience.org/users/nmahalikcsufresnoedu

Appendix 2

List of equipment and instrumentation systems as mentioned in the Proposal

Name, address, and telephone number (or website) of vendor	Type of equipment/instrumentation	Equipment name	Catalog or part number	Unit price	Total price
Trimble Military and Advanced Systems, Inc. trimble.com	GIS/GPS Components and Systems	Time-Frequency Tools	Thunderbolt® Lab Kit (p/n 62989-90)	$1,195	$5,975
		Real-time Kinematic (RTK) Correction Systems	Force 22E	$5,000	$5,000
		GNSS-Inertial Positioning and Orientation Systems	AP20	$39,995	$39,995
		Positioning and Heading Systems	BD910	$2,812	$2,812
		Communications Boards and Kit	BD920-W3G	$5,478	$5,478
		GPS Device	Trimble® Juno® T41™	$1,546	$15,460
		Yield Mapping Systems	Trimble harvest solution	$7,000	$7,000
			Trimble FastMap Video Surveyor System	$5,000	$5,000
MEMSIC Inc. memsic.com		Wireless Sensor Network (OEM)	WSN-OEM2110CB	$3,595	$3,595
		Wireless Sensor Network (Pro)	WSN-PRO2400CB	$2,195	$2,195
Headwall Photonics, Inc. Headwallphotonics.com		Remote Sensing & Analysis Sensor	Micro-Hyperspec® VNIR A-Series Concentric Imaging Spectrometer (1003B-20401)	$37,000	$37,000
Open Source		Network Simulation	NS 2	Free	$0
			J-Sim	Free	$0

		Software			
Aeroquadstore aeroquadstore.com/	UAV/MR Components and Systems	Quadrocopter	AeroQuad Cyclone ARF Kit + Remote control	$625	$6250
RobotShop Inc. robotshop.com		Uptech Voyager IV 4x4 Robot Development Platform	RB-Upt-06	$46,000	$46,000
			RB-Ins-05	$19,995	$19,995
		CropCam Agricultural UAV	RB-Cro-01	$6,789	$20,367
		UAV Development Components and Accessories	MVVS 61 engine + lithium battery + servos + CR + stabilization unit + GPS + air foils	$2,000	$10,000
		Scouting Quad Copter UAV	RB-Vik-01	$2,400	$12,000
		1394 CCD camera	RB-Mes-07	$4,200	$4,200
Adept MobileRobots LLC mobilerobots.com		Mobile Robot and Accessories	Pioneer P3AT (3T5001)	$5,599	$27,995
			Controllers and accessories (ACT0112)	$3,775	$18,875
			Software	$595	$2,975
			Charger	$280	$560
			Battery	$47	$238
			PTZ Network camera	$3,745	$7,490
			Research PatrolBot Base (PAT0010)	$14,995	$14,995
			Navigation system for PAT	17,195	$17,195
			Seekur	$ 69,995	$ 69,995
			Navigation system for Skr	$26,991	$26,991
			Controller (ACT0300)	$5,946	$5,946
			2nd controller (ACT0302)	$5,946	$5,946
			Inertial sensor	$13,426	$13,426

Abra Electronics, Inc. abra-electronics.com	SCADA Components and Systems	Digital Electronics Lab Kit	DL800	$399.99	$4,800
Trihedral Engineering Limited trihedral.com		SCADA Software	VTScada	$4,995	$4,995
AzeoTech, Inc. **azeotech.com**			DAQFactory	$3,198	$15,990
Triangle Research international, Inc. triplc.com		SCADA Microcontrollers	Nano-10 PLC Kits and Accessories	$249	$2,490
			Nano-10 PLC	$139	$1,390
Vegetronix vegetronix.com		Soil Moisture Sensor	VH400-2M	$37.95	$579
		Temperature Sensor	THERM200-2M	$31.95	$639
		Voltage to current loop translator	CUR-LOOP-TRANS-3	$19.95	$399
Home Depot homedepot.com		Sprinklers (normal and impact types)	Netafim products (1/2”, 1”, 1.5”; quarter, half, full, etc.)	$5	$500
		Plastic Water Pipes	Various sizes	$2/ft	$500
		Valves, Caps, Accessories	Various sizes	$25-$50	$1,500
Shipping charges (Approximately)					$1,500
Grand Total					$496,231

Acct # Code/Typ	Description	G/L Date	Do Ty	Document Number	Supplier Number	Invoice Number	Purchase Order	Amount	Units
Job Number . .	350290	SENSE/CONTROL USING GPS/GIS'15							
1									
9548	Equipment								
	JAMECO ELECTRONICS	01/30/15	PP	618976	52769	16530571-001	44691	3,875.72	
	JAMECO ELECTRONICS	01/30/15	PP	618976	52769	16530571-001	44691	20.55	
	JAMECO ELECTRONICS	01/30/15	PP	618976	52769	16530571-001	44691	318.78	
	JAMECO ELECTRONICS	01/30/15	PP	618976	52769	16530571-001	44691	28.10-	
	TURBINE TECHNOLOGIES L	01/13/15	PP	617840	176069	3128	44307	31,915.25	
	TURBINE TECHNOLOGIES L	01/13/15	PP	617840	176069	3128	44307	1,198.51	
	TURBINE TECHNOLOGIES L	01/13/15	PP	617840	176069	3128	44307	2,625.03	
	TURBINE TECHNOLOGIES L	01/13/15	PP	617840	176069	3128	44307	98.58	
	APPLANIX CORP WIRE BAL	01/09/15	JE	134232				33,342.49	
	APPLANIX CORP WIRE BAL	01/09/15	JE	134232				22.00	
	HEADWALL PHOTONICS	01/07/15	PP	617479	175715	00004300	44121	48,870.00	
	HEADWALL PHOTONICS	01/07/15	PP	617479	175715	00004300	44121	475.00	
	HEADWALL PHOTONICS	01/07/15	PP	617479	175715	00004300	44121	4,019.56	
	LASER MAN, INC	01/07/15	PP	617480	176117	2006437-IN	44340	33,070.00	
	LASER MAN, INC	01/07/15	PP	617480	176117	2006437-IN	44340	115.35	
	LASER MAN, INC	01/07/15	PP	617480	176117	2006437-IN	44340	2,720.01	
	LASER MAN, INC	01/07/15	PP	617480	176117	2006437-IN	44340	231.11-	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617481	48338	XJM6R3413	44402	512.46	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617481	48338	XJM6R3413	44402	8.00	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617481	48338	XJM6R3413	44402	42.15	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617482	48338	XJM3O31R2	44402	1,734.47	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617482	48338	XJM3O31R2	44402	3.00	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617482	48338	XJM3O31R2	44402	142.66	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617482	48338	XJM3O31R2	44402	28.62-	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617483	48338	XJM467RP7	44402	15,200.24	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617483	48338	XJM467RP7	44402	33.00	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617483	48338	XJM467RP7	44402	1,250.22	
	DELL COMPUTER-A/P (PLA	01/07/15	PP	617483	48338	XJM467RP7	44402	404.41-	
	WIRE-APPLANIX CORP	12/17/14	JE	133850				14,393.18	
	WIRE-APPLANIX CORP	12/17/14	JE	133850				22.00	
	WIRE-APPLANIX CORP	12/17/14	JE	133850				1,183.84	
	REVERSE USE TAX APPLAN	12/17/14	JE	134058				1,183.84-	
	TRIANGEL RESEARCH INTE	12/05/14	PP	615429	175990	00025303	44281	4,354.00	
	TRIANGEL RESEARCH INTE	12/05/14	PP	615429	175990	00025303	44281	100.50	
	TRIANGEL RESEARCH INTE	12/05/14	PP	615429	175990	00025303	44281	358.12	
	MAHALIK, NITAIGOUR P.	11/24/14	PV	614205	134662	11/10/14		887.39	
	MEMSIC TRANSDUCER SYST	11/20/14	PP	613916	175440	CI-14103006	43986	3,595.00	
	MEMSIC TRANSDUCER SYST	11/20/14	PP	613916	175440	CI-14103006	43986	110.00	
	MEMSIC TRANSDUCER SYST	11/20/14	PP	613916	175440	CI-14103006	43986	295.69	
	CALIFORNIA SURVEYING A	11/06/14	PP	613167	58543	K20910/1	43984	10,995.00	
	CALIFORNIA SURVEYING A	11/06/14	PP	613167	58543	K20910/1	43984	904.34	
	MEMSIC TRANSDUCER SYST	11/04/14	PP	612981	175440	20141013	43985	100.00	
	MEMSIC TRANSDUCER SYST	11/04/14	PP	612981	175440	20141013	43985	2,195.00	
	MEMSIC TRANSDUCER SYST	11/04/14	PP	612981	175440	20141013	43985	180.54	
	TERRIS GPS	10/28/14	PP	612359	175439	80490	43997	3,538.75	
	TERRIS GPS	10/28/14	PP	612359	175439	80490	43997	26.75	
	TERRIS GPS	10/28/14	PP	612359	175439	80490	43997	291.06	
	TERRIS GPS	10/28/14	PP	612361	175439	80491	43998	4,260.75	
	MAHALIK, NITAIGOUR	06/26/14	PV	602994	134662	06/19/14		774.76	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	27,995.00	1.00

Acct # Code/Typ	Description	G/L Date	Do Ty	Document Number	Supplier Number	Invoice Number	Purchase Order	Amount	Units
Job Number . .	350290	SENSE/CONTROL USING GPS/GIS'15							
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	18,875.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	4,725.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	1,875.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	2,350.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	2,375.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	395.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	1,400.00	5.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	1,000.00	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	2,302.59	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	1,552.47	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	388.63	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	154.22	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	193.29	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	195.34	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	32.49	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602570	171966	0005951-IN	42754	115.15	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	69,995.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	5,946.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	195.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	26,991.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	1,696.00	1.00
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	1,700.00	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	5,757.09	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	489.06	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	16.04	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	2,220.01	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602571	171966	005912-IN	42753	139.50	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602572	171966	0005922-IN	42752	31,995.00	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602572	171966	0005922-IN	42752	575.00	
	ADEPT MOBILE ROBOTS	06/20/14	PP	602572	171966	0005922-IN	42752	2,631.59	
	ROBOT SHOP	06/18/14	PP	602307	171812	10140015	42699	11,172.00	
	ROBOT SHOP	06/18/14	PP	602307	171812	10140015	42699	918.90	
	ROBOT SHOP	06/18/14	PP	602308	171812	10140013	42699	9,359.20-	
	ROBOT SHOP	06/18/14	PP	602308	171812	10140013	42699	769.79-	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	19,995.00	1.00
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	4,279.00	1.00
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	999.75-	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	213.95-	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	1,644.59	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	351.95	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	82.23-	
	ROBOT SHOP	06/13/14	PP	601828	171812	10142671	42699	17.60-	
	ROBOT SHOP	05/27/14	PP	599974	171812	10140016	42699	13,298.10	2.00
	ROBOT SHOP	05/27/14	PP	599974	171812	10140016	42699	1,093.77	
	ROBOT SHOP	05/14/14	PP	599008	171812	10138889	42699	9,359.20	5.00
	ROBOT SHOP	05/14/14	PP	599008	171812	10138889	42699	769.79	
					Cost Type 9548 Equipment			496,013.87	46.00
					SENSE/CONTROL USING GPS/GIS'15			496,013.87	46.00
								496,013.87	46.00

California State University, Fresno Foundation
Sponsored Programs
Equipment
For Fiscal Year Ending June 30, 2015
(Purchase Price Equal to or Exceeds $5,000)

ASSET #	ASSET DESCRIPTION	VENDOR NAME	SERIAL #	DATE OF PURCHASE	PAA	PROJECT DIRECTOR	CONTACT INFORMATION EXTENSION / EMAIL	PURCHASE PRICE	JDE DOCUMENT NUMBER	CHECK NUMBER	COST CENTER	ACCOUNT NAME
832	MicroPilot MP-Vision UAV Glider	RobotShop	N/A	5/1/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 6,649.05	599974	315641	350290	SENSE/CONTROL USING GPS/GIS'15
833	MicroPilot MP-Vision UAV Glider	RobotShop	N/A	5/2/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 6,649.05	599974	315642	350290	SENSE/CONTROL USING GPS/GIS'15
834	ZOMBY Remote Controlled Tracking platform	RobotShop	RB-Ins-05	5/20/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 19,995.00	601828	316823	350290	SENSE/CONTROL USING GPS/GIS'15
835	Pioneer LX	adept Mobile Robot	12804-600 REV-B	6/5/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 31,995.00	602572	317149	350290	SENSE/CONTROL USING GPS/GIS'15
836	P3-AT Robot	adept Mobile Robot	ATGMCC4284	6/4/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 5,599.00	602570	317149	350290	SENSE/CONTROL USING GPS/GIS'15
837	P3-AT Robot	adept Mobile Robot	ATGMCC4282	6/4/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 5,599.00	602570	317149	350290	SENSE/CONTROL USING GPS/GIS'15
838	P3-AT Robot	adept Mobile Robot	ATGMCC4281	6/4/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 5,599.00	602570	317149	350290	SENSE/CONTROL USING GPS/GIS'15
839	P3-AT Robot	adept Mobile Robot	ATGMCC4283	6/4/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 5,599.00	602570	317149	350290	SENSE/CONTROL USING GPS/GIS'15
840	P3-AT Robot	adept Mobile Robot	ATGMCC4285	6/4/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 5,599.00	602570	317149	350290	SENSE/CONTROL USING GPS/GIS'15
841	Seekur Robot Base	adept Mobile Robot	SKR0060	5/27/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 106,523.00	602571	317149	350290	SENSE/CONTROL USING GPS/GIS'15
846	Trimble WM-TOPO Survey System	Laserman, Inc.	96900-91	12/17/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 17,995.00	617480	617480	326462	SENSE/CONTROL USING GPS/GIS'15
847	Nomad Handheld W/Modem	Laserman, Inc.	5307K51312	12/17/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 11,995.00	617481	617481	326463	SENSE/CONTROL USING GPS/GIS'15
848	Hyperspec VNIRE A-Series Concentric Imaging Spectrometer	Headwall Photonics	1003B-10143	12/30/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 22,050.00	617479	326459	350290	SENSE/CONTROL USING GPS/GIS'15
850	Hyperspectral Data Processing Unit	Headwall Photonics	1005A-31180	12/30/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 11,250.00	617479	326459	350290	SENSE/CONTROL USING GPS/GIS'15
851	Hyperspec Pan & Tilt, Small Payload	Headwall Photonics	1003B-30048	12/30/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 14,400.00	617479	326459	350290	SENSE/CONTROL USING GPS/GIS'15
852	AP 15 with standalone PCS	Applanix Corporation	40100	12/22/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 25,500.00	113850	N/A	350290	SENSE/CONTROL USING GPS/GIS'15
853	POSPac MMS V7 x Node-Lcoed Software License	Applanix Corporation	40100	12/22/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 15,340.00	133850	N/A	350290	SENSE/CONTROL USING GPS/GIS'15
854	Centrifugal Flow/Programmable Process Control System	Turbine Technologies	PUMPLAB	12/29/2014	NZ	N.P. Mahalik	8-2995/nmahalik	$ 31,915.25	617840	326650	350290	SENSE/CONTROL USING GPS/GIS'15

California State University, Fresno Foundation
Sponsored Programs
Equipment
For Fiscal Year Ending June 30, 2015
(Purchase Price Equal to or Exceeds $5000)

ASSET #	ASSET DESCRIPTION	ASSET LOCATION	CONDITION	DATE DISPOSED	TAGGED	STILL IN USE?	LAST PHYSICAL INV DATE	NON-PHYSICAL INVENTORY	NOTES	SOURCE OF FUNDS	CONTRACT END DATE	COST CENTER
832	MicroPilot MP-Vision UAV Glider	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	05/30/14	N/A	No serial numbers identified, Questionaire	FED	01/31/15	350290
833	MicroPilot MP-Vision UAV Glider	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	05/31/14	N/A	No serial numbers identified, Questionaire	FED	01/31/15	350291
834	ZOMBY Remote Controlled Tracking platform	WET, 2911 E. Barstow, Storage building, Fresno CA, 93740	New	N/A	Yes	Yes	06/19/14	N/A	Kept in South most storage building	FED	01/31/15	350290
835	Pioneer LX	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
836	P3-AT Robot	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
837	P3-AT Robot	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
838	P3-AT Robot	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
839	P3-AT Robot	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
840	P3-AT Robot	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A		FED	01/31/15	350290
841	Seekur Robot Base	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	06/19/14	N/A	A combination of multiple units	FED	01/31/15	350290
846	Trimble WM-TOPO Survey System	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
847	Nomad Handheld W/Modem	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
848	Hyperspec VNIRE A-Series Concentric Imaging Spectrometer	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
850	Hyperspectral Data Processing Unit	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
851	Hyperspec Pan & Tilt, Small Payload	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
852	AP 15 with standalone PCS	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
853	POSPac MMS V7 x Node-Lcoed Software License	IT, 2671 E. Barstow, RM 118, Fresno, CA 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290
854	Centrifugal Flow/Programmable Process Control System	WET, 2911 E. Barstow, Storage building, Fresno CA, 93740	New	N/A	Yes	Yes	01/16/15	N/A		FED	01/31/15	350290

I have reviewed this California State University, Fresno Foundation Equipment Inventory listing and certify this information is correct.

New Location (if applicable):_____

Project Director Signature: _____ Date: _____

Appendix 5

Zimbra **nmahalik@csufresno.edu**

Re: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

From : Prem Mahalik <nmahalik@csufresno.edu> Thu, Nov 06, 2014 01:20 PM
Subject : Re: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)
To : Liyi CIV USARMY ARO Dai (US) <liyi.dai.civ@mail.mil>
Cc : Tywanki Q CTR USARMY ARO Seegars (US) <tywanki.q.seegars.ctr@mail.mil>, Tristan CIV USAF AFRL RESEARCH Nguyen (US) <tristan.nguyen@us.af.mil>, Patricia A CIV USARMY USAMC Huff (US) <patricia.a.huff26.civ@mail.mil>

Liyi:
Thank you and best regards.
Sincerely,
Prem
====

From: "Liyi CIV USARMY ARO Dai (US)" <liyi.dai.civ@mail.mil>
To: "Prem Mahalik" <nmahalik@csufresno.edu>
Cc: "Tywanki Q CTR USARMY ARO Seegars (US)" <tywanki.q.seegars.ctr@mail.mil>, "Tristan CIV USAF AFRL RESEARCH Nguyen (US)" <tristan.nguyen@us.af.mil>, "Patricia A CIV USARMY USAMC Huff (US)" <patricia.a.huff26.civ@mail.mil>, "Liyi CIV USARMY ARO Dai (US)" <liyi.dai.civ@mail.mil>
Sent: Wednesday, October 29, 2014 10:55:37 AM
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Prem,

Your re-budget request has been approved provided that the overall budget remains the same with no additional funding needed.

Please refer to the email below from Dr. Nguyen and Ms. Patricia Huff for

details.

Thanks,

Liyi

Liyi Dai, Ph.D.
Computing Sciences Division
U.S. Army Research Office
P.O. Box 12211
4300 S. Miami Blvd
Research Triangle Park, NC 27709-2211
Voice: (919) 549 - 4350
Fax: (919) 549 - 4248
Email: liyi.dai.civ@mail.mil

-----Original Message-----
From: Dai, Liyi CIV USARMY ARO (US)
Sent: Wednesday, October 29, 2014 1:45 PM
To: Nguyen, Tristan CIV USAF AFRL RESEARCH (US); Huff, Patricia A CIV USARMY USAMC (US)
Cc: Seegars, Tywanki Q CTR USARMY ARO (US); Dai, Liyi CIV USARMY ARO (US)
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

I concur.

Liyi Dai, Ph.D.
Computing Sciences Division
U.S. Army Research Office
P.O. Box 12211
4300 S. Miami Blvd
Research Triangle Park, NC 27709-2211
Voice: (919) 549 - 4350
Fax: (919) 549 - 4248
Email: liyi.dai.civ@mail.mil

-----Original Message-----
From: NGUYEN, TRISTAN N CIV USAF AFMC AFOSR/RTC [mailto:tristan.nguyen@us.af.mil]
Sent: Wednesday, October 29, 2014 1:24 PM

To: Huff, Patricia A CIV USARMY USAMC (US); Dai, Liyi CIV USARMY ARO (US)
Cc: Seegars, Tywanki Q CTR USARMY ARO (US)
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Hi Patricia,

I approve the PI's request.

Regards,
Tristan

-----Original Message-----
From: Huff, Patricia A CIV USARMY USAMC (US)
[mailto:patricia.a.huff26.civ@mail.mil]
Sent: Wednesday, October 29, 2014 12:43 PM
To: Dai, Liyi CIV USARMY ARO (US)
Cc: NGUYEN, TRISTAN N CIV USAF AFMC AFOSR/RTC; Seegars, Tywanki Q CTR USARMY
ARO (US)
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hello Dr. Dai,
If you concur with Dr. Nguyen on the re-budget request as outlined in the email below, and the budget remains the same with no additional funding needed, then it is ok to proceed with the changes indicated in the 10/28/14 email (with no further OSD approvals needed).

More specifically, the answers to the questions posed are:
1) Yes, the PI can purchase the equipment from another vendor given the reasons indicated.
2) Yes, the 15 laptop computers can be purchased. They will be dedicated to the DoD focused research and not general use computers.

Hope this is helpful. Thank you for your inquiry.
Have a great day.
Patricia

Patricia A. Huff
HBCU/MI Program Manager
Army Research Office/ARL
Technology Integration & Outreach Division
E-Mail: Patricia.A.Huff26.civ@mail.mil
Phone: 919-549-4283

-----Original Message-----
From: Dai, Liyi CIV USARMY ARO (US)
Sent: Wednesday, October 29, 2014 7:16 AM
To: Huff, Patricia A CIV USARMY USAMC (US)
Cc: Nguyen, Tristan CIV USAF AFRL RESEARCH (US); Dai, Liyi CIV USARMY ARO (US)
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Patricia,
Such change of purchase or vendors is allowed as long as the overall budget remains the same, right? Please advise.
Thanks,
Liyi

Liyi Dai, Ph.D.
Computing Sciences Division
U.S. Army Research Office
P.O. Box 12211
4300 S. Miami Blvd
Research Triangle Park, NC 27709-2211
Voice: (919) 549 - 4350
Fax: (919) 549 - 4248
Email: liyi.dai.civ@mail.mil

-----Original Message-----
From: Prem Mahalik [mailto:nmahalik@csufresno.edu]
Sent: Tuesday, October 28, 2014 8:12 PM
To: Dai, Liyi CIV USARMY ARO (US); Nguyen, Tristan CIV USAF AFRL RESEARCH (US)
Subject: Re: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Dear Dr. Dai and Dr. Nguyen,

I introduce myself as the Principal Investigator of the above grant award (Proposal Number : 64768-CS-REP) from DOD.

I have some queries in regard to adjustment in purchasing the equipment through this grant.

1. In our proposal, I had mentioned the name of the vendors from where a piece of equipment/system would be purchased. Now, a couple of vendors are either not supplying the equipment/system or the price is much higher than the requested amount. So, it would be good if I purchase similar equipment but from different vendor(s) without compromising the purpose and quality. My query is can I purchase similar equipment but from another vendors?

2. I have already procured many of the equipment and software systems (mobile robots, UAV, remote sensing systems, etc.) as per the proposal. In the proposal, I had proposed to develop a living-lab. In the living-lab many of the DOD equipment and software systems will be interfaced with the computers for their use and operation. The DOD equipments and software systems purchased through this grant actually need computers for their full-scale operation and usage. Earlier, my plan was to interface the DOD equipment and software systems with our existing computers which are available in one of the labs in our department. However, those computers are old, and being used for general purposes, and sometimes they are not available whenever the students/researchers need them to work with DOD equipment and software systems in the living-lab room. In this respect, it will be really best and also advantageous if dedicated computers are available to interface with the DOD equipments and software systems. I am therefore proposing to purchase 15 laptop computers through this grant. These laptops will not be used for general-purpose activities (as per DOD requirement) but be used to support DOD-relevant research and education program/purpose. As such, the dedicated computers will enhance the capacity and scope of education and research. We then can have a full-scale dedicated living-lab room for the student researchers and faculty. These laptops will significantly enhance the DOD-relevant research program activities. My second query is that can we purchase the laptop computers for the purpose mentioned above through this grant? There is no additional cost involved. That is the purchase of laptops will be within the granted budget. It will be an internal adjustment. Also, the purchase of computers will not compromise the purchase of other equipments needed for the project.

Please let me know if you approve the above requests.

Best regards.

Sincerely,

Prem

====

Nitaigour "Prem" Mahalik, Ph.D.
==========
Associate Professor
Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology California State University, Fresno
M/S: IT9, 2255 E Barstow Ave.
California, 93740,
USA

Phone: (559) 278-2995
Fax: (559) 278-2145
http://www.fresnostate.edu/jcast/indtech/index.html
http://badging.societyforscience.org/users/nmahalikcsufresnoedu

_____

From: "Brandon S CIV Hill (US)" <brandon.s.hill24.civ@mail.mil>
To: "Office of Research & Sponsored Programs" <orsp@csufresno.edu>
Cc: nmahalik@csufresno.edu, "Grace Liu" <gliu@csufresno.edu>, "Liyi CIV Dai (US)" <liyi.dai.civ@mail.mil>, "Tristan CIV Nguyen (US)" <tristan.nguyen@us.af.mil>, "L Nicole CTR USARMY ARO Elliott-Foster (US)" <latrietha.n.elliott-foster.ctr@mail.mil>, "Patricia A CIV USARMY USAMC Huff (US)" <patricia.a.huff26.civ@mail.mil>
Sent: Tuesday, February 18, 2014 12:36:28 PM
Subject: RE: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good Afternoon,

Please see attached Grants Officer Representative appointment letter. Please sign and date at the bottom and return back to me at your earliest convenience.

Thank you

Brandon Hill
Contract/Grant Specialist
U.S. Army Contracting Command - APG - RTP Division
Phone: (919) 549-4337
Brandon.s.hill24.civ@mail.mil

-----Original Message-----
From: Hill, Brandon S CIV (US)
Sent: Tuesday, January 28, 2014 11:34 AM
To: 'Office of Research & Sponsored Programs'
Cc: nmahalik@csufresno.edu; Grace Liu; Dai, Liyi CIV (US); Nguyen, Tristan CIV (US); Elliott-Foster, L Nicole CTR USARMY ARO (US); Huff, Patricia A CIV USARMY USAMC (US); 'onr_seattle@navy.mil'
Subject: Grant W911NF-14-1-0069 Award (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good Morning,

Please see attached signed and fully executed award for Grant # W911NF-14-1-0069 with California State University - Fresno. No more action is required on your part.

Thank you

Brandon Hill
Contract/Grant Specialist
U.S. Army Contracting Command - APG - RTP Division
Phone: (919) 549-4337
Brandon.s.hill24.civ@mail.mil

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Sole source justification for the product SKR0001 (Seekur)

Date: 3.6.2014

This sole source justification is written for the product SKR0001 (Seekur) to be purchased from the Adept MobileRobot LLC based on company's Quote# 9365.

The Quote received from Adept MobileRobot LLC mentions that the Adept MobileRobots LLC is sole manufacturer and sole US source of Adept MobileRobots LLC robots. All Adept MobileRobots are designed for teaching and research environments. The robotic platform is fully accessible from a control perspective, so we are free to customize the hardware and software as needed or just use the basic features to teach, research, and demonstrate robotic concepts.

1. What are the unique performance features of the product or brand requested that are not available in any other product or brand.

The SKR0001 (Seekur) is a Mobile Robot base which includes (a) on-board computer [the computer has multiple roles: (i) it serves as computing platform, (ii) serves as an interface for external RF system, (iii) it serves as a controller.] with Operating System, (b) wireless Ethernet, (c) laser mapping and navigation system, (d) front and rear sonar, (e) front bumpers, (f) gyroscope, (g) color status indicator, (h) 13-hr run battery, (i) autonomous docking and charging station, (j) joystick, (k) speech synthesizer and speaker, (l) Geographical Positioning System, (i) accessory mounting deck. This product is capable of providing autonomous functions with a feature called skid-steering to be used in indoors as well as some outdoor research environments. It can also provide basis of developing algorithms for avoidance of collision through integrated sonar and software library. These unique features are necessary for this project. In other words, these features are exactly required for this project. We did not find these performance features in other products from other manufacturers.

2. Why are the unique features required?

The product SKR0001 (Seekur) is an ideal platform for outdoor research projects. It is the latest rover type mobile robot and is designed based on open-architecture concept. The open-architecture is very important as this feature facilitates plug-and-play concept where other required and standardized equipment and tools can be integrated as and when needed. One of the project objectives is to purchase such a platform which should sustain for longer period of time. In this respect, SKR0001 (Seekur), which is an open-architecture platform, is the best fit. It has the capability and the required features as described in (1) above. The robotic platform has required functions and example resources for our education and research needs per proposal goals and objectives. The components that are attached to this product are minimal in numbers, extensive capability, and compact in nature for which it is best suited for a higher education work environment. The platform is compatible to standardized interfaces and connections. Multitude of research accomplishments (as per project objective) can be achieved by using this platform that has configurable and scalable capability.

3. What other items or brands were evaluated, rejected, and why? A minimum of three vendors must be surveyed.

We explored for other options and possibilities. We could not find any contemporary brand with required performance and features that are in SKR0001 (Seekur). No other supplier offers the depth of

platforms, features, accessories, and software for teaching and research purposes. They have been in business for more than 15 years and have a reputation for ongoing technical support for any of their newer and older robots. This product offers high power and autonomous functionality all in a weatherized outdoor package. It includes laser and GPS localization and mapping capabilities through Adept MobileRobots proprietary ARNL and MOGS software libraries. The unique combinations of features mentioned in (1) allow the robots to operate autonomously in various environments. They can be used for precise positioning, mapping and object/collision avoidance. They include unique software library that offers pre-coded functions to control the robot's microcontroller and to interface with other sensors and apparatus, and will allow us to code our own unique software. This robot will allow us reverting focus from building and troubleshooting the basic robotic hardware and software functionality to teaching and researching targeted topics and applications.

CSU The California State University
OFFICE OF THE CHANCELLOR

December 17, 2014

To: CSU Presidents

From: G. Andrew Jones
Associate Vice Chancellor and Deputy General Counsel

Re: Unmanned Aerial Vehicles (aka Drones)

Recently, a growing number of faculty, staff and students have expressed keen interest in using Unmanned Aerial Vehicles ("UAV") in connection with or as part of their official university activities. You may have also heard UAVs referred to as Unmanned Aircraft Systems ("UAS"). They are most commonly called drones. As the cost of UAVs drops substantially, and the versatility and experience in their multiple possible uses increases, interest by CSU personnel and students in UAV use is both exciting and understandable. We in the OGC share in the excitement and potential that UAVs offer. That said, we also are working hard to assure that CSU's UAV use is legally compliant so as to best position us to leverage UAV use in the near future as legal restrictions begin to ease - a process that we are not just monitoring, but in which we are working hard to be an active participant. In the meantime, this short memo provides a current lay of the land in UAV use.

The operation of UAVs by public universities such as CSU is regulated and controlled by the Federal Aviation Administration ("FAA"). Violations of FAA rules and regulations can result in stiff federal penalties. For that reason, we want to dispel misconceptions that may exist about what is or is not allowable or required under current FAA rules and regulations. Under current FAA rules and regulations:

- All UAVs are subject to FAA rules and regulations. This includes UAVs used or operated by a public university such as CSU.

- Any UAV operated by CSU within United States civilian airspace is subject to FAA rules and regulations. There is no 400 feet or other distance limit to the FAA's jurisdiction.

- In order for a public university such as CSU to operate a UAV, it must apply for and be granted a Certificate of Authorization ("COA") from the FAA. When granted, the COA allows the UAV to be used only for the limited purpose or activity specified in the application. There appears to be no likelihood of a systemwide application for a COA. Rather, this will be a use-by-use and campus-by-campus process.

- There is absolutely ***no*** public university exemption or exception to the COA requirement. Any faculty, staff or student operating or using a UAV in connection with or as part of his/her official CSU activities ***must*** obtain a COA, even if it is intended to be used solely for research purposes.

- The FAA will grant a COA to a public entity only if the UAV is being used for a non-commercial purpose. The FAA is the ultimate decider of whether a particular activity is commercial or non-commercial in nature.

- Only public entities are eligible to receive a COA. For example, auxiliary organizations are not public entities within the meaning of the FAA's rules and regulations and, therefore, are not eligible for a COA. Auxiliary organizations are regarded as civil operators subject to a different and more stringent set of rules and regulations. With a few narrow exceptions, the FAA has not authorized the use of UAVs by civil operators.

- Hobbyists and recreational users are not required to obtain a COA before operating a UAV. They are subject to a different set of guidelines and rules. CSU and individuals operating a UAV in connection with their employment capacity do ***not*** qualify as hobbyists or recreational users.

We hope this information proves useful for you. Your campus should not be operating a UAV in any capacity unless you have obtained a COA from the FAA. If you are operating a UAV without a COA and believe you are exempt from that requirement, please contact the Office of General Counsel so we can discuss your situation in detail.

Again, we are aware and understand that several campuses are highly interested in UAV use, and applying for a COA. We also are aware and understand that this is a significant and important subject for campuses. Please be assured that we in the process of determining how best to help campuses successfully apply for a COA in this complicated and developing regulatory area, and also how CSU can provide input to and influence the development of FAA policy in this area. In that spirit, I am leading a UAV working group at the OGC to pursue these purposes. If you have either questions or information that you would like to share regarding CSU and UAVs, please don't hesitate to contact us.

c: Timothy P. White, Chancellor
Steven Relyea, Executive Vice Chancellor and Chief Financial Officer
Ephraim Smith, Executive Vice Chancellor and Chief Academic Officer
Framroze Virjee, Executive Vice Chancellor and General Counsel
Garrett Ashley, Vice Chancellor, University Relations and Advancement
Lori Lamb, Vice Chancellor, Human Resources

The California State University
OFFICE OF THE CHANCELLOR

Larry Mandel, Vice Chancellor and Chief Audit Officer
CSU Vice Presidents of Administration & Finance
CSU Provosts
CSU Risk Managers

Appendix 8a

Zimbra **nmahalik@csufresno.edu**

Re: Unmanned Aerial Vehicles used for Sponsored Projects | Questionnaire | Please Return

From : Prem Mahalik <nmahalik@csufresno.edu> Mon, Jul 14, 2014 04:15 PM

Subject : Re: Unmanned Aerial Vehicles used for Sponsored Projects | Questionnaire | Please Return 2 attachments

To : Kristopher Westcott <kwestcott@csufresno.edu>

Cc : Nathan Zanoni <nzanoni@csufresno.edu>, Linda Christian <lindacar@csufresno.edu>

Hello Kris,

I have attached the Questionnaire. The answers are given just below the Questions.

Please let me know if I am missing any.

Thanks.

Prem
====

Nitaigour "Prem" Mahalik, Ph.D.
==========
Associate Professor
Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology
California State University, Fresno
M/S: IT9, 2255 E Barstow Ave.
California, 93740,
USA

Phone: (559) 278-2995
Fax: (559) 278-2145
http://www.fresnostate.edu/jcast/indtech/index.html

From: "Kristopher Westcott" <kwestcott@csufresno.edu>
To: "Np Mahalik" <nmahalik@csufresno.edu>

Cc: "Nathan Zanoni" <nzanoni@csufresno.edu>, "Linda Christian" <lindacar@csufresno.edu>
Sent: Monday, July 14, 2014 12:35:41 PM
Subject: Unmanned Aerial Vehicles used for Sponsored Projects | Questionnaire | Please Return

Hello Dr. Mahalik,

RE: Unmanned Aerial Vehicles used for Sponsored Projects

Because of significant risks to the University and its Auxiliary Organization, CSURMA and AORMA are now making available a special aviation liability insurance program. As a result, there is a questionnaire that is required to be completed and returned to our insurance company. Please find it attached to this email.

Please complete this questionnaire, thoroughly addressing each question with respect to your newly purchased UAV's. Understanding that you are currently out of the county, please return it to us electronically as soon as possible.

Thank you,

Kristopher Westcott
Post Award Assistant
Foundation Financial Services
California State University Fresno Association, Inc.
4910 N. Chestnut
Fresno, CA 93726
P:559.278.0904
F:559.278.0992
www.auxiliary.com/foundation

FRESNO STATE
Discovery. Diversity. Distinction.

FRESNO STATE
Discovery. Diversity. Distinction.

FS-horizontal.jpg
382 KB

Unmanned Aerial Vehicles - Memorandum-1 (Questionaire).docx
100 KB

FRESNO STATE Discovery Diversity Distinction

Memorandum

To:

From:

Re: Unmanned Aerial Vehicles used on a Sponsored Project

Auxiliary Organization: California State University, Fresno Foundation

Complete the following information for unmanned aerial vehicles used on a sponsored project

1. For each UAV, please provide Make, Model, Value (or cost).

There are two identical UAVs.
Distributor/Make: Robot Shop
Model/Product No: RB-Cro-01
Value: $6648.05

2. Size and Weight (include detailed specifications).

• Length = 4 foot
• Wing Span = 8 foot
• Weight = 6 pounds
• Engine (electric) = Axi Brushless
• 2.4 Ghz radio modem, range is 3 km or 2 miles
• Duration = 55 minutes
• Batteries = 4 Thunder Power L-Polymer 2100 mah / 11.1 volts (3 cell)
• Surfaces = Rudder, elevator and ailerons
• Average speed = 60 kmh
• Maximum Winds = 30 kmh

3. Fixed wing or Rotor wing?

Fixed.

4. Annual hours of operation?

Not known. These UAVs will be used in an education setting. Students will learn about its components and the way it works. Occasionally, the UAVs will be used for testing, demonstration and experiment. 10-20 hours could be a good estimate.

5. Describe purpose and use.

Educational, learning.

6. Experience of operator (operated by staff only, pilot qualification)?

Pilot is not required. These are remote controlled (RC) small UAVs and Auto-Pilot based. No personnel or pilot needed for operation.

7. Describe others including students who are allowed to operate UAVs (include qualification, experience, and supervision).

Not known at this point. As this is a remote controlled (RC) UAV, anyone who knows how to use a standard RC will be able to control. No personnel or pilot needed for operation.

8. Airports/Airfield where you launch and return UAVs (location of take-offs and landings)?

Not needed. Not applicable.

9. Is coverage for Physical Damage to the UAV itself needed? If YES, please provide value.

No.

10. Maximum Altitude flown and general location / air space of operation?

Maximum Altitude: 100 meters. The UAVs will be used within Fresno State's farm area within the campus.

11. Are all UAVs equipped with take-off point return or parachute deployment technology?

Not applicable as this is a small UAV for education.

Appendix 9a

Zimbra **nmahalik@csufresno.edu**

Re: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

From : Ram Nunna <rnunna@csufresno.edu> Wed, Jan 07, 2015 05:17 PM
Subject : Re: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones) 5 attachments
To : Prem Mahalik <nmahalik@csufresno.edu>
Cc : Gregory Kriehn <gkriehn@csufresno.edu>
Reply To : Ram Nunna <rnunna@csufresno.edu>

I think we have already applied. Waiting for a decision.
Check with Dr. Kriehn. I have cc'd him on this email.

Ram.

From: "Prem Mahalik" <nmahalik@csufresno.edu>
To: "Ram Nunna" <rnunna@csufresno.edu>
Sent: Wednesday, January 7, 2015 5:15:43 PM
Subject: Re: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

Dean Nunna,

Thank you for the information.

As I read, it seems COA should be obtained *campus-by-campus* basis. Have your college or any department already obtained/applied for COA from FAA? If no one has applied yet and planning to apply, please include us.

Thanks.

Prem
====

From: "Ram Nunna" <rnunna@csufresno.edu>
To: "Gregory Kriehn" <gkriehn@csufresno.edu>, "Walter Mizuno" <walterm@csufresno.edu>, "Riadh Munjy" <riadhm@csufresno.edu>, "Gemunu Happawana" <ghappawana@csufresno.edu>, "Nagy Bengiamin" <bengiami@csufresno.edu>, "Prem Mahalik" <nmahalik@csufresno.edu>, "Athanasios

Alexandrou" <aalexandrou@csufresno.edu>
Cc: "Ram Nunna" <rnunna@csufresno.edu>
Sent: Wednesday, January 7, 2015 4:35:36 PM
Subject: Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

FYI.

Thanks.

Ram Nunna

From: "Lynnette Zelezny" <kbrassfi@csufresno.edu>
To: "Ram Nunna" <rnunna@csufresno.edu>, "Jesus Larralde Muro" <jesuslm@csufresno.edu>, "Kathleen Brassfield" <kbrassfi@csufresno.edu>
Cc: "Lynnette Zelezny" <lynnette@csufresno.edu>
Sent: Wednesday, January 7, 2015 4:09:21 PM
Subject: Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

Afternoon Drs. Nunna and Larraldo Muro,

Dr. Zelezny has requested your review of the new guidelines from the Chancellor's office. Please follow up with her on Fresno State's status of meeting the requirements.

Thank you.

Katha

From: "vpaa-owner on behalf of Michelle Kiss" <mkiss@calstate.edu>
To: "vpaa" <vpaa@lists.calstate.edu>
Cc: "vpaa-asst" <vpaa-asst@lists.calstate.edu>
Sent: Wednesday, December 17, 2014 10:16:50 AM
Subject: FW: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

The attached memorandum regarding *Unmanned Aerial Vehicles (aka Drones)* is sent to you at the request of Associate Vice Chancellor and Deputy General Counsel, G. Andrew Jones.

Michelle Kiss, MPA

Director of Special Projects, Academic Affairs

The California State University
OFFICE OF THE CHANCELLOR

401 Golden Shore, 6th Floor, Long Beach, CA 90802-4210
Tel 562-951-4603 / Fax 562-951-4981 / E-mail: mkiss@calstate.edu

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Please consider the environment before printing this email

From: Bolden, December
Sent: Wednesday, December 17, 2014 9:38 AM
To: csu-presidents; csu-presassistants
Cc: White, Timothy (twhite@calstate.edu); Relyea, Steven; Smith, Ephraim P.; Framroze Virjee (fvirjee@calstate.edu); Ashley, Garrett P.; Lamb, Lori; Mandel, Larry; Andy Jones
Subject: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

Please see the attached which is sent on behalf of Associate Vice Chancellor and Deputy General Counsel, G. Andrew Jones.

Thank you,

The California State University
GENERAL COUNSEL

December Bolden

Chief of Staff

T - 562-951-4497

F - 562-951-4956 or 4959

dbolden@calstate.edu

--
On behalf of Lynnette Zelezny
Katha Brassfield
Executive Assistant
Office of the Provost
California State University, Fresno
5200 N. Barton Avenue, M/S ML54
Fresno, California 93740
Phone: 559.278.6651

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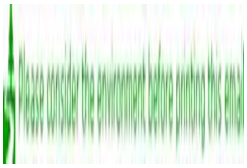

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Appendix 9b

Zimbra **nmahalik@csufresno.edu**

Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

From : Athanasios Alexandrou <aalexandrou@csufresno.edu> Thu, Jan 08, 2015 08:58 AM

Subject : Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones) 6 attachments

To : Np Mahalik <nmahalik@csufresno.edu>, Arun Nambiar <anambiar@csufresno.edu>, Balaji Sethuramasamyraja <balajis@csufresno.edu>, Daming Zhang <dazhang@csufresno.edu>, Darnell Austin <daustin@csufresno.edu>, Matthew Yen <matthewy@csufresno.edu>, Tony Au <tonya@csufresno.edu>

Cc : Christina Fitz Gibbon <christif@csufresno.edu>

Colleagues,

Please see attached memo regarding drones.

Please let me know if you have any comments.

Best regards,

Alex

A. Alexandrou, Ph.D
Professor and Chair, Department of Industrial Technology
California State University - Fresno,
2255 E. Barstow Av. MS IT 9
Fresno, California 93740
Phone: 559-278-2145, Direct: 559-278-1951
Fax: 559-278-5081

From: "Ram Nunna" <rnunna@csufresno.edu>
To: "Gregory Kriehn" <gkriehn@csufresno.edu>, "Walter Mizuno" <walterm@csufresno.edu>, "Riadh Munjy" <riadhm@csufresno.edu>, "Gemunu Happawana" <ghappawana@csufresno.edu>, "Nagy Bengiamin" <bengiami@csufresno.edu>, "Prem Mahalik" <nmahalik@csufresno.edu>, "Athanasios Alexandrou" <aalexandrou@csufresno.edu>
Cc: "Ram Nunna" <rnunna@csufresno.edu>
Sent: Wednesday, January 7, 2015 4:35:36 PM

Subject: Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

FYI.

Thanks.

Ram Nunna

From: "Lynnette Zelezny" <kbrassfi@csufresno.edu>
To: "Ram Nunna" <rnunna@csufresno.edu>, "Jesus Larralde Muro" <jesuslm@csufresno.edu>, "Kathleen Brassfield" <kbrassfi@csufresno.edu>
Cc: "Lynnette Zelezny" <lynnette@csufresno.edu>
Sent: Wednesday, January 7, 2015 4:09:21 PM
Subject: Fwd: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

Afternoon Drs. Nunna and Larraldo Muro,

Dr. Zelezny has requested your review of the new guidelines from the Chancellor's office. Please follow up with her on Fresno State's status of meeting the requirements.

Thank you.

Katha

From: "vpaa-owner on behalf of Michelle Kiss" <mkiss@calstate.edu>
To: "vpaa" <vpaa@lists.calstate.edu>
Cc: "vpaa-asst" <vpaa-asst@lists.calstate.edu>
Sent: Wednesday, December 17, 2014 10:16:50 AM
Subject: FW: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

The attached memorandum regarding *Unmanned Aerial Vehicles (aka Drones)* is sent to you at the request of Associate Vice Chancellor and Deputy General Counsel, G. Andrew Jones.

Michelle Kiss, MPA
Director of Special Projects, Academic Affairs
CSU The California State University
OFFICE OF THE CHANCELLOR
401 Golden Shore, 6th Floor, Long Beach, CA 90802-4210
Tel 562-951-4603 / Fax 562-951-4981 / E-mail: mkiss@calstate.edu

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From: Bolden, December
Sent: Wednesday, December 17, 2014 9:38 AM
To: csu-presidents; csu-presassistants
Cc: White, Timothy (twhite@calstate.edu); Relyea, Steven; Smith, Ephraim P.; Framroze Virjee (fvirjee@calstate.edu); Ashley, Garrett P.; Lamb, Lori; Mandel, Larry; Andy Jones
Subject: E-mail from G. Andrew Jones - Unmanned Aerial Vehicles (aka Drones)

Please see the attached which is sent on behalf of Associate Vice Chancellor and Deputy General Counsel, G. Andrew Jones.

Thank you,

December Bolden
Chief of Staff
T - 562-951-4497
F - 562-951-4956 or 4959
dbolden@calstate.edu

--
On behalf of Lynnette Zelezny
Katha Brassfield
Executive Assistant
Office of the Provost
California State University, Fresno
5200 N. Barton Avenue, M/S ML54

Fresno, California 93740
Phone: 559.278.6651

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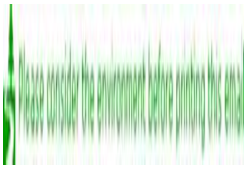

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Memo to Presidents re Unmanned Aerial Vehicles aka Drones.pdf
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Appendix 9c

Zimbra **nmahalik@csufresno.edu**

Fwd: [RAC] FW: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

From : Prem Mahalik <nmahalik@csufresno.edu> Thu, Jan 15, 2015 02:15 PM

Subject : Fwd: [RAC] FW: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

To : Sandra Witte <sandraw@csufresno.edu>, Mechel Paggi <mpaggi@csufresno.edu>, Athanasios Alexandrou <aalexandrou@csufresno.edu>

FYI....
This Conference Call is overlapping with our department meeting.
Thanks.
Prem
====

From: "Nathan Zanoni" <nzanoni@csufresno.edu>
To: "Prem Mahalik" <nmahalik@csufresno.edu>
Cc: "Kristopher Westcott" <kwestcott@csufresno.edu>
Sent: Wednesday, January 14, 2015 4:55:30 PM
Subject: Fwd: [RAC] FW: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

FYI - Please see e-mail below regarding the conference call on Friday, January 16th at 10:00 AM Pacific if you're interested.

From: "Linda Christian" <lindacar@csufresno.edu>
To: "Kris Westcott" <kwestcott@csufresno.edu>, "Adriana Mendoza" <admendoza@csufresno.edu>, "Christina" <cmodica@csufresno.edu>, "Crystal Costa" <ccosta@csufresno.edu>, "Cynthia" <clomonaco@csufresno.edu>, "Gomez" <ngomez@csufresno.edu>, "Nathan Zanoni" <nzanoni@csufresno.edu>
Sent: Wednesday, January 14, 2015 3:47:34 PM
Subject: Fwd: [RAC] FW: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

FYI... If you know of any PIs working with UAVs (drones) you may want to let them know about this conference call.

Thanks,

Linda Christian
Post Award Manager
Foundation Financial Services
California State University Fresno Association, Inc.
4910 N. Chestnut, Fresno, CA 93726
(559)278-0852
www.auxiliary.com

FRESNO STATE
Discovery. Diversity. Distinction.

From: "Scott L Perez" <scott.perez@csun.edu>
To: raccsu@googlegroups.com
Sent: Wednesday, January 14, 2015 3:36:39 PM
Subject: [RAC] FW: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

All,

I'm not sure how many campuses are using UAVs, but the info. below may be of use for those looking to get FAA approval.

Thanks,

Scott

****

Scott Pérez
Director
Research and Sponsored Projects
California State University, Northridge
18111 Nordhoff Street
Northridge, CA 91330-8232

Ph: (818) 677-2901
Fax: (818) 677-4691

--Sí se puede--

From: "Nykaza, Madeline" <MNykaza@APLU.ORG>
Cc: "Gobstein, Howard" <HGobstein@APLU.ORG>, "Poulakidas, Jennifer" <JPoulakidas@APLU.ORG>, "Sebeok, Jessica A." <Jessica.Sebeok@aau.edu>, "Smith, Tobin L." <toby_smith@aau.edu>
Date: January 14, 2015 at 1:34:28 PM PST
Subject: CGA & CRPGE Announcement (1-14-15): Conference Call Regarding sUAS Proposal

Dear Colleagues,

APLU and AAU will host a conference call **Friday, January 16 at 1pm** to share more details about and to answer questions you have regarding our collective effort to file Section 333 sUAS exemption petitions. The goal of this call is to help explain this effort, including providing more details about the potential value to universities of filing a 333 petition.

Lisa Ellman and Mark McKinnon of McKenna Long & Aldridge, LLP will be on the call to answer your specific questions. In the interest of efficiency, **please submit your questions to us by 5:00 pm EST on Thursday, January 15** so we can forward your questions to Lisa and Mark in advance.

Please use the following call-in information:

Dial-In: 1-800-768-2983

Passcode: 627-8668

Best regards,

Jennifer Poulakidas

Madeline Nykaza

Toby Smith

Jessica Sebeok

From: Nykaza, Madeline
Sent: Friday, January 09, 2015 3:25 PM
Cc: Gobstein, Howard
Subject: CGA & CRPGE Action Request (1-9-15): Unmanned Aircraft Systems Proposal

CGA & CRPGE ACTION REQUEST

(1-9-15)

To: Council on Governmental Affairs

Council on Research Policy and Graduate Education

From: A·P·L·U Congressional and Governmental Affairs Staff

Because many universities operating small unmanned aircraft systems (sUAS) for research and educational projects are having difficulty securing approval to do so, APLU and the American Association for Universities (AAU) are partnering to coordinate filings for Section 333 Federal Aviation Administration (FAA) petitions for exemption. A Section 333 exemption petition, once approved, would provide authority for a university to conduct research projects using sUAS, under certain conditions. Currently, only a few private sector companies have received Section 333 exemptions to fly sUAS. We are contacting you to gauge your institution's interest in participating in such a coordinated approach.

The Section 333 process is complex and technical, requiring the submission of an operations manual as well as information specific to each university. Several of our members have expressed interest in pursuing a coordinated approach, which would benefit substantially from legal expertise in the field, as well as economies of scale.

Accordingly, APLU and AAU solicited proposals from law firms with established sUAS practice groups and experience submitting Section 333 exemption requests. We have determined that the proposal from McKenna, Long & Aldridge (MLA) is most appropriate for our collective needs. Depending on how many universities are interested in filing for a Section 333 exemption, the cost will be approximately $7,000- $10,000 per university (the cost will be more for university systems if multiple campuses are involved), with the cost

decreasing as the number of universities joining the effort increases. The cost would include developing a common template and voluntary standards for all universities applying, customizing a Section 333 petition and manual for each university, and any necessary follow up with the FAA on each individual petition. The primary point of contact at McKenna Long would be Lisa Ellman. Lisa is Counsel in the Washington, D.C. office and serves as co-chair of MLA's sUAS Practice Group. She has significant federal government experience in the UAS field. For further information about her background, please click here. For further information on MLA's sUAS practice group, please click here.

It would be in the best interest of universities seeking approval to use sUAS for research and educational purposes to apply as soon as soon as possible – the queue for such applications is rapidly growing longer. Moreover, we feel the information gathered to file for 333 exemptions will be helpful as we prepare to respond to newly proposed federal rules guiding sUAS use, expected to be released sometime in the next couple of months. Please let us know your definite (or even potential) interest in having your institution join this collective effort to file Section 333 exemption petitions with the FAA by **COB on Tuesday, January 20**. This information will give us a better sense of the cost per university; we will seek firm institutional commitments shortly thereafter.

If you have any questions or to let us know your interest, please contact Jennifer Poulakidas (jpoulakidas@aplu.org) or Madeline Nykaza (mnykaza@aplu.org).

Appendix 10a

Zimbra **nmahalik@csufresno.edu**

IT Precision Agriculture Technology minor

From : Mary Olivas <maryo@csufresno.edu> Fri, Mar 07, 2014 11:46 AM
Subject : IT Precision Agriculture Technology minor
To : Mary Olivas <maryo@csufresno.edu>

FYI!

Please let all JCAST students, staff and faculty know that IT's new minor, Precision Agriculture Technology, has been approved by the University and it will be offered in Fall 2014.

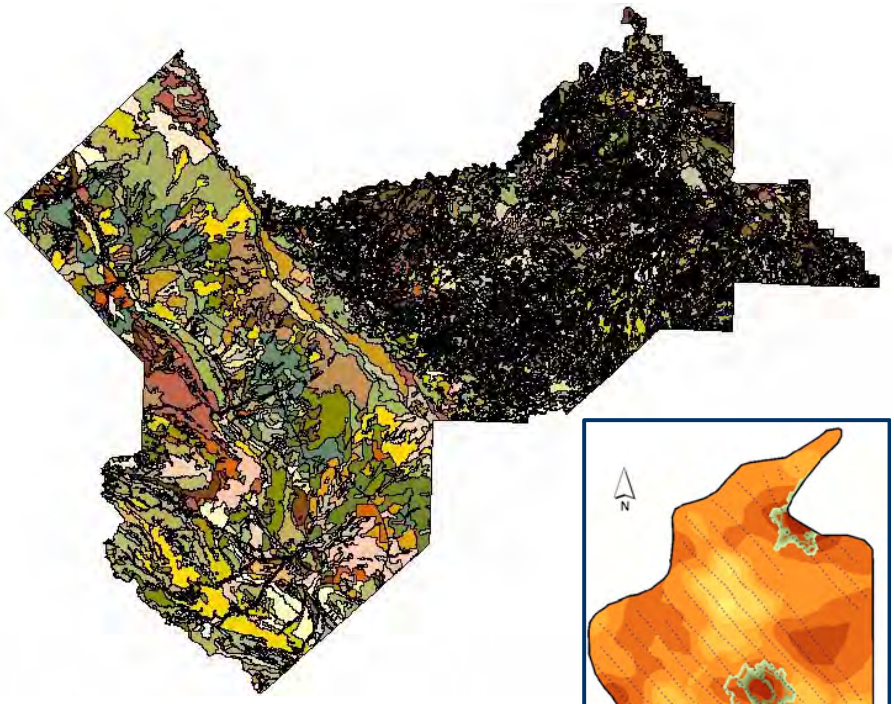
Thank you,

Alex

A. Alexandrou, Ph.D
Chair, Department of Industrial Technology
California State University,
2255 E. Barstow Av. MS IT 9
Fresno, California 93740
Phone: 559-278-2145, Direct: 559-278-1951
Fax: 559-278-5081

JORDAN COLLEGE OF AG. SCIENCES & TECHNOLOGY

Precision Agriculture Technology Minor for JCAST - Plant Science, Agricultural Business, Animal Sciences & Ag. Education, and Viticulture & Enology Students



Tot: 15 Units (4 Courses & Activity)

CONTACT
Dr. Balaji Seth
Ag. Minor Coordinator
Dept of Industrial Technology
Jordan College of Ag. Sciences & Technology, Fresno, CA
balajis@csufresno.edu
Phone: 559-278-2145

FresnoStateIndTech
IndTechFresno

Recommended Road Map

Semester I (Fall): IT 52, IT 116

Semester II (Spring): IT 156, IT 186 (Co-Op Concurrently)

or **Semester III (Summer/Fall):** IT 190/194/199

IT 52 : Basic Electricity and Electronics

IT 116: Data Collection and Analysis

IT 156: Electric, Hydraulic and Pneumatic Motor Control

IT 186: Precision Agriculture/Site-specific Crop Mgt.

IT 19X: Project/Independent Study/Co-op ***(190/194/199)***